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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Psychotherapy in General Practice. By R. D. GILLESPIE, M.R.C.P., D.P.M. 1
The Modern Conception of Nephritis, and its Bearing on Certain Problems of Life Assurance. By T. IZOD BENNETT, F.R.C.P. (*Illustrated*) 8
The Anatomy of Asthma as Disclosed by Lipiodol Investigation. By J. B. CHRISTOPHERSON, F.R.C.P.—(*With illustrative plate*) 11
Radiographic Diagnosis of Prostatic Enlargement. By NORMAN ROSS, M.B. (*With illustrations on plate*) 14
Slipping of the Epiphysis of the Head of the Femur: its Relation to Renal Rickets. By J. F. BRAILSFORD, M.D.—(*With illustrations on plate*) 16
Facial Palsy and Infection with Zoster Virus. By R. S. AITKEN, M.R.C.P., and R. T. BRAIN, M.R.C.P. 19

CLINICAL AND LABORATORY NOTES

A Staining Method for the Direct Typing of Pneumococci. By F. C. O. VALENTINE, M.R.C.P. 22
Myeloid Leukæmia Treated with the Four-Gramme Radium Bomb. By G. W. PHILLIPS, M.B., D.M.R.E.—(*Illustrated*) .. 22
The Occurrence of Gout During the Treatment of Pernicious Anæmia. By W. G. SEARS, M.R.C.P. ... 24

REVIEWS AND NOTICES OF BOOKS

A System of Surgery. Edited by Prof. C. C. Choyce, F.R.C.S. Pathological Editor: Prof. J. M. Beattie, M.R.C.S. ... 25
Synthetic Anatomy. By J. E. Cheesman, L.M.S.S.A. 26
Diseases of the Blood. By A. Piney, M.R.C.P. 26
Studien über die Entstehung und den Verlauf der Lungenkrankheiten. By Prof. N. Ph. Tendeloo 27
Nervous Disorder in Infancy and Childhood. By N. Hobhouse, M.R.C.P. 27
Human Cancer. By A. P. Stout, M.D. 27
Précis de cancérologie. By Prof. G. Ducuing 28
The Causes of Evolution. By J. B. S. Haldane, F.R.S. 28
Microscopic Slide Precipitation Tests for the Diagnosis and Exclusion of Syphilis. By B. S. Kline, M.D. 28

LEADING ARTICLES

EFFICIENCY IN MEDICAL PRACTICE 29
METABOLISM OF THE CANCER CELL 30
PSYCHOTHERAPY IN THE CURRICULUM 31

ANNOTATIONS

The New Year Honours 33
The Sex Hormones 32
Rectal or Vaginal Examination in Labour 33
"The Social Problem Group" 33
The Liver in Eclampsia 34
London's University Centre (*Illustrated*) 34
"Homeostasis" 35
Diphtheria Control in South Australia 35
On the Testing of Hearing .. 36
Pneumonia in the Steel Industry 36
Animals as a Responsibility 37
Zoster Virus and Bell's Palsy 37
Brompton Hospital Reports 37

NEW INVENTIONS

A Pocket Percussor. By S. W. Smith F.R.C.P.—(*Illustrated*) 24

SPECIAL ARTICLES

New Work on Hormones. By Prof. W. SCHOELLER (*Illustrated*) 38
Out-patient Departments: their Use and Abuse 42
The Value of Massive Radiation: Final Report of the Conference on Radium ... 44
The Future of American Medical Practice 47
Medicine and the Law: Nuisance by a Mental Patient.—Noise as an Actionable Wrong 49
Ireland: the Irish Hospitals' Sweepstakes 49
New Year Honours 50

THE DOCTOR'S DAY

IX.—The Anæsthetist 51

PANEL AND CONTRACT PRACTICE

The Out-patient Inquiry.—Psychotherapy under the Act 54

CORRESPONDENCE

Gastrostomy versus Intubation (Mr. E. Watson-Williams and Dr. J. E. G. McGibbon) 55
Epsom College: Museum of Biology (Mr. A. E. Ellis) 56
Anæsthesia for Acute Intestinal Obstruction (Dr. C. Langton Hewer) .. 56
Arseniuretted Hydrogen Poisoning (Dr. W. H. F. Oxley) 57
Tropical Ulcer (Dr. J. H. Sequeira) 57

THE SERVICES

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Service 50

PUBLIC HEALTH SERVICES

Public Health in the Local Acts of 1931–32 52
Infectious Disease in England and Wales 53

OBITUARY

Sir Alexander Hendry, M.D. 59
Walter Robert Hadwen, M.D. 59

MEDICAL NEWS

Univ. of Oxford 58
Univ. of Cambridge 58
Univ. of London 58
Soc. of Apothecaries 58
National Assoc. for Prev. of Tuberculosis 50
Seaham Hall Tuberculosis Sanatorium 57
Lectures on Primitive Man 58
Royal Sanitary Institute .. 58
Congress on Care of Children 58
German Soc. for Study of Circulation 58
Post-graduate Courses in Berlin 58
Fellowship of Med. and Post-Grad. Med. Assoc. 58
Hunterian Society 59
Royal Institution 59
Institute of Medical Psychology 59
National Smoke Abatement Society 59
Lebanon Hospital 59

NOTES, COMMENTS, AND ABSTRACTS

The Medical Schools and the Nation's Health. By JAMES YOUNG, M.D.—(*To be concluded*) 61
Instruction on Sex Questions 63
Applying Knowledge to Increase Happiness 64
Dried Milk with Added Iron 64
Entertainment for the Blind 64

Births, Marriages, Deaths 59
Medical Diary 60
Appointments 60
Vacancies 60

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PHYSICIAN AND LECTURER IN PSYCHOLOGICAL MEDICINE, GUY'S HOSPITAL

IT is still asserted occasionally, and the curriculum in many medical schools still seems to support the assertion, that psychiatry is mainly a post-graduate subject; by which it is implied that psychiatry is a highly specialised branch of medicine, too abtruse for medical students, and rather useless in practice anyway.

The reason for this view lies probably in the fact that the statutory teaching in psychological medicine is confined to the demonstration of patients resident in mental hospitals. What a small proportion of the whole field of psychiatry is occupied by the in-patient population of mental hospitals is well shown by the statistics of a special out-patient department in a general hospital, such as the department for nervous diseases and psychological medicine at Guy's. Of approximately 600 consecutive cases, 436, or nearly three-quarters, were diagnosed as psychoneuroses, and 129, or under one-quarter, were diagnosed as psychoses, including for convenience and contrast in that category not only manic-depressive, involutional melancholic, schizophrenic and paranoid conditions, and organic reaction types, but epileptics and mental defectives as well. In other words, at an out-patient clinic designed to cater for all kinds of mental and nervous illness, the psychoneuroses were at least three times as frequent as all the other mental conditions lumped together. Further significance lies in this, that hardly any psychoneuroses are admitted to mental hospitals; they remain as one of the sets of problems of which general practice is composed.

It would be a mistake to regard the above figures as more than a pointer towards the relative numerical importance of psychoneuroses and psychoses. It is extremely probable that the incidence of psychoneurotic conditions among the general population is considerably greater than the figures for a special clinic indicate. After all, the general practitioner sees in each year of his work only a few patients who are obviously psychotic—i.e., suffering from a mental illness of a type and severity necessitating admission to a mental hospital—and to say that he encounters psychoneurotic conditions thrice as often is not to assert much in absolute numbers. But it is only the more obvious cases of psychoneuroses that are referred to a special department. The rest remain as out-patients in other departments of the hospital, being regarded as part of the inevitable load of cases of the more chronic kind. One's gynæcological colleagues declare that many of their patients are suffering not from any important physical lesion, but from psychoneurotic conditions whose symptomatic expression seems to be mainly in the gynæcological field. The same applies to dermatology, to cardiology, and, in fact, to medicine in general. The point is not simply that psychoneurotic conditions occur which masquerade as gynæcological, dermatological, cardiac, or other states of bodily ill-health, but that a numerically important proportion do so. Such statistics as can be obtained are indirect in their bearing but their meaning is unmistakable. A well-known consultant in general medicine, who sees as wide a range of conditions as most people, and who certainly does not have any prejudices in favour of psychological medicine, tells me that among the six most frequent diagnoses which he is called upon to make, "anxiety-neurosis," as he calls it, is one. I have asked many doctors in general practice what proportion of psychoneuroses they roughly estimate they encounter in their everyday work, and they have given me estimates which, for fear of seeming to overstate the case, I shall not quote.

There is another source of information, however. Everyone knows that the rise in the cost of sickness benefit, under the National Health Insurance Act, has been causing concern. Inquiries in certain industries have shown that as much as 60 per cent. of the time lost through sickness is lost through psychoneurotic illness of some kind or other (Lockhart).

It is still, I think, necessary to labour the considerable prevalence of psychoneurotic illness because older views die hard; and many, perhaps the majority, of psychoneuroses still go unrecognised under diagnosis of anæmia, gastric catarrh, debility, neurasthenia, and the like. But enough has been said to show how important it is for any doctor to be able to recognise and, if possible, to treat conditions of such frequency and of such polymorphous symptomatic appearance.

The Psychotherapist's Equipment

As for treatment, there is an impression, and it is partly true, that psychotherapy is a specialist's job. So it is, in its more technical forms. But a considerable proportion of psychoneuroses do not require a highly specialised technique. This is as well, since technical psychotherapy is essentially a prolonged affair in many instances. What is commonly described as the old type of family doctor had an insight into, and a consequent ability to treat, psychoneurotic conditions because he had a profound knowledge of human nature. But such almost unconscious psychotherapy has its limitations, and there is no reason why the general practitioner of to-day, in spite of the preoccupation of his medical education with X rays, blood tests, and other laboratory methods, should not be more successful than his predecessor of 50 years ago in treating the symptomatic results of life's difficulties, dissatisfactions, and disharmonies, in the health of his patients.

The first requirement of a psychotherapist is a good knowledge of general medicine, otherwise he is likely to involve his patients in danger and himself in ridicule. Nowhere in medicine is a knowledge of the natural history of disease of more use than in the diagnosis of psychoneurotic illness as a first step towards treatment. In psychological medicine, almost more than in any other branch, an accurate history is indispensable not only for diagnosis but, as I hope to show, for treatment. In mental illness of any kind it is still clinical observation that matters most. For the great majority of mental illnesses and especially for the psychoneuroses, serological, radiological, and other laboratory experiments are of only negative value, as excluding the possibility of organic disease. Much of the rest of the psychotherapist's equipment is already contained in the phrase "a knowledge of general medicine," because

* A lecture delivered before the Leeds Medical Society.

that knowledge should include something about the psychology of human nature. But this is a field in which too much knowledge is, in a sense, a dangerous thing. The tendency for the man who specialises in psychotherapy is to make his own path more and more difficult. He sees ever-widening theoretical ramifications in every case he meets, and anything short in time and thoroughness of what he considers the ideal is stultified by his own lack of confidence in it. The tendency is for some of us to become increasingly ineffective in the use of shorter methods, and to look back regretfully to the days of our psychotherapeutic adolescence, when we would produce not cures, perhaps, but dramatic improvements in a minimum of time. The preface to T. A. Ross's book on "The Common Neuroses" gives a good account of a progress of the kind. There is another danger, too, that a wide theoretical knowledge applied without a critical and careful discrimination, based on extensive experience, can do a psychoneurotic patient harm which it is very hard to repair.

What knowledge, then, of psychology should the general practitioner have? He should have a sympathetic acquaintance with what is called human nature, which means its envyings, jealousies, rivalries, as well as its affections. He should have also an appreciation of the power of conflicts arising in relation to such tendencies to produce bodily disturbances. In other words, he should have an appreciation, based on experience, of how psychological factors can cause what looks like "disease." I propose to specify the kind of knowledge I mean, first by giving some indication of the kinds of symptoms that are in practice most commonly produced by psychological factors, and then by describing some actual examples of typical psychological conflicts and their resolution by simple methods of psychotherapy.

Classification

Psychopathologists are often accused of being too academic. I will therefore try to make this address as practical as may be, and for that purpose will make the most ordinary subdivision possible of the disorders that constitute our subject matter.

The subdivision is into the definitely curable and the merely manageable. By "curable" I mean capable of active treatment, immediately following upon which the symptoms disappear; by "manageable" I mean lending itself only to symptomatic treatment and recovering, if it does recover, only with the passage of time, however much one may flatter oneself about one's own share in the matter. Of course, such a division is completely unscientific. In therapeutics one man's meat is another man's poison; what some of us would rejoice to treat, others should avoid like the plague; this is true of psychotherapy if not of other branches of medical treatment. But in psychotherapeutics it is certain patients, not certain diseases, that are specially apt for treatment by some doctors and not by others. It is a matter of personalities and of particular types of personal as well as clinical experience.

If I am to give a list of the functional nervous conditions falling into the curable group, it is with the understanding that they are to be regarded as types specially susceptible to cure, and that individual instances may not prove curable at anyone's hands. The curable disorders include many cases included in the following purely symptomatic categories.

1. *Nervous exhaustion*, in which, in addition to feeling exhausted, the patient often complains of brain fag, poor memory, excessive fatigue, irritability, or insomnia.

2. The *anxiety group*, in which the complaints are of headache (of the type of "pains in the head" or "a constricting band"), giddiness, palpitation, præcordial pains, insomnia, indigestion (pains in the stomach not specially related to meals), tremulousness, polyuria, &c.

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4. *Hysteria* of the "conversion" type: weakness, paralysis, or tremor of limbs, fancy gaits, aphonia, anæsthesia of special senses, loss of memory, and fugues.

5. A very common type: *depression of spirits*. These are frequently varieties of group 2.

6. Certain *morbid fears*, especially of illness and usually a part of group 2. Other morbid fears (phobias) such as fears of open or closed spaces, fear of animals, of going out alone, cannot so readily be placed in this class. Many of them are curable—all of them theoretically so—but many of them only by technical and prolonged methods of psychotherapy. This is especially true of those morbid fears which form part of the symptom-picture of obsessive compulsive psychoneuroses. Only a minor proportion of the latter are susceptible of cure, even by prolonged analytic psychotherapy.

Compensation neuroses, although usually having the form of an anxiety state or of hysteria, belong, as a rule, to the manageable and not to the curable class. I shall not refer further to the other merely manageable types in general; for the most part they are what one usually designates as psychoses, although I do not want it to be inferred that no psychosis is susceptible of psychotherapy.

Physical Examination

There are some general principles which apply to all the types. An essential preliminary is a careful physical examination. This is not entirely for one's own satisfaction; it helps to establish the patient's confidence. Frequently these nervous patients have been dismissed with a rather cursory examination in the past, they are obviously healthy physically; they have often cried "Wolf," and now it is assumed to be the same again. Even if they have frequently been examined by others to one's own knowledge, I believe that it is very desirable when consulted by such a patient to make a physical examination. A very large number of them fear that they have some physical disease. Modern psychotherapy is largely a talking cure, but few such patients believe much that is said to them by a doctor who has never examined them. If a physical lesion is discovered it is necessary to consider its relevance to the complaints.

The fallacy of irrelevant pathology.—Even definite septic foci, pace the bacteriologists, have not necessarily a causal relation to the symptoms. I have met a patient who had tonsillectomy, mastoidectomy, appendicectomy, cholecystectomy, and myomectomy, and still retained her symptoms which were typically neurotic. I have met another who, in the early days of this operation, had a gastro-enterotomy for a "dropped stomach," the symptoms referred to which depended largely on her father's bad temper. "Better a dinner of herbs where love is, than a stalled ox and hatred therewith." Another unmarried woman had all her teeth out because, if her doctor had only known it, she was unhappy at home; while the loss of her teeth made it all the more likely that she would have to remain there.

The fallacy of phantastic pathology.—Neurotic symptoms have, until recent times, been so mysterious that when no organic lesion has been discovered, the natural tendency has been to suppose that there must be a lesion somewhere if one were only clever enough, or one's instruments refined enough, to discover it. There was, for example, the eyestrain hypothesis. It is interesting to note that at a meeting of ophthalmologists, reported in the *British*

Medical Journal about two years ago, it had been discovered that errors of + or − 1 D. do not cause nervous exhaustion, and that the correct treatment was not glasses but common-sense guidance of the patient's life, which "did not require the coöperation of a psychopathologist," whereby they spurned those who had taught them wisdom. But the commonest diagnoses of this kind are still anæmia, gastric catarrh, influenza, and auto-intoxication—anæmia for any vague symptoms whatever; gastric catarrh for symptoms referred to the digestive functions; and influenza for symptoms of more acute onset, especially malaise, weakness, and trembling. When influenza is mentioned in the history I have learned to examine the details carefully; often there has been no pyrexia, and the only diagnosis has been the patient's own. The same applies to any other diagnosis, and indeed to any other statement proffered by the patient. One of the things I have learned is never to take, without further inquiry, anything a psychoneurotic patient says about important events in his history at its face value.

Fallacies of omission.—Errors in diagnosis of the kind described arise from the simple facts that the examination has been incomplete, and that the copious influence of mental factors in producing symptoms has not been considered. As students we received from our medical curriculum a strong bias in favour of a physical ætiology for everything. Things are changing now, but until very recent years it was uncommon for students to be taught that præcordial pain, breathlessness, and the like, could result from mental conflict, or that hysteria was anything but the weird perversity of the congenitally queer. The result is that our investigations have usually been incomplete, no matter how thorough the physical examination may have been, because the psychological aspect has been persistently overlooked. In 99 cases out of 100 in which no adequate physical lesion has been found it is correct to assume a psychological cause. It impressed me considerably after acquiring the physical bias imparted by my clinical teachers, who were unceasingly modernising themselves, as they quite rightly thought, by basing their teaching more and more upon physiology, to find on working in a physiological laboratory as a post-graduate that the physiologists themselves were acutely conscious of what they called the psychological factor. These attitudes of the clinicians to the physiologists and of the physiologists to psychology remind me of Bertrand Russell's remark about the physicists and the biologists. The biologists, he says, turn for the consolation of ultimate explanations to the physicists, while the physicists of late years turn only to God.

Psychological Examination

A clinical examination can include the psychological aspect of a man without much extra trouble. There are two kinds of psychological examination which might well be called the cross-sectional and the longitudinal. The first is directed simply to eliciting the presence of symptoms which are psychological and is principally of diagnostic value. The simple query "Are you worried?" may often give a chance for most useful information to appear. There is a short form of inquiry which we use on those lines as a routine at out-patients at Guy's, and which usually prevents one missing, even in the hurried work of an out-patient department, the essential manifestation of nervous or mental illness. Neglect of even this shortened survey can lead to serious errors. I have seen a hospital report on a case of general paralysis of the insane in which the mental aspect was dismissed with the comment "mentality normal." Fortunately, in general paralysis some very definite physical signs ordinarily come to the rescue. But in the psychoneuroses they are not there to do so.

One of the commonest experiences is to find a patient who has had several abdominal operations for certain symptoms referred to the alimentary tract, although there has been no definite signs, and who is no better, but rather worse after the operation than before. In many instances the operation would have been avoided if such a brief cross-sectional mental examination had been made as I have indicated. Not long ago I saw a man who had undergone an exploratory laparotomy for certain symptoms in his abdomen. It had not been observed that he was depressed and anxious, and that eighteen months previously he had been in a mental hospital where he had complained of the same symptoms which had disappeared with a temporary remission in his mental state. A still more striking instance of this sort came to my notice some years ago of a patient who had had an exploratory craniotomy.

His complaint was that he had frequent headaches, and that his left hand went into spasms at irregular intervals. A careful neurological examination revealed what was believed to be a spasm of the right sternomastoid and a slight left facial weakness. On the basis of these admittedly slight signs a meningioma was diagnosed, and on the strength of this neurological opinion the surgeon, very reluctantly and doubtfully, operated. He did not find the meningioma that had been diagnosed, which did not surprise him. The skull-flap was closed, and because some thickening of the arachnoid had been noted the house surgeon wrote up on the patient's bed-letter the diagnosis, "chronic meningitis." Subsequently it was discovered that the patient was going round public libraries consulting encyclopædia articles on meningitis. This prompted new inquiries, and it was found that the patient had been depressed and worried before the operation, that for years he had been discontented with his job, and that at home he was cantankerous. In brief, the clinical signs of a mental condition were so much more positive than those of any physical disease, that the greater probability lay in a diagnosis of an anxiety state than of a meningitis. The subsequent history, extending over three years, has proved the accuracy of this opinion.

The cross-sectional clinical examination of the psychological factors is, however, of mainly diagnostic value; for treatment the longitudinal method, in other words, the taking of a history of the patient as well as the history of his symptoms is essential. The cases which I shall quote will illustrate in some degree the use of the longitudinal method.

I should add also that care in eliciting symptoms of a psychological type, and in taking an accurate history, is not a sufficient prelude to successful treatment. It is also necessary to have sound views on psychopathology, and to have at least an appreciation that the symptoms can be produced by purely psychological causes. This avoids such catastrophes as one I saw recently. A woman in the late 'thirties had complained of various paræsthesia, trembling, and other symptoms which together were correctly enough labelled "neurasthenia." But the treatment prescribed for the neurasthenia was hysterectomy, and a perfectly sound uterus was removed, with the usual result in such circumstances that the patient remained as ill as before and certainly with less prospect of recovery. Such a history-taking should ordinarily precede a physical examination, but in practice it would save time in some instances if it followed the physical survey. If we assume that nothing physically abnormal has been found, or if found does not seem to be relevant, the next stage in treatment is to obtain the type of history I have mentioned, and to see if one can correlate the

development of the symptoms with the patient's own account of himself and of his circumstances.

Nervous Exhaustion

Patients of the first group, those complaining of exhaustion, furnish some of the simplest examples of this method. It happens that I have encountered a patient whose story singularly well exhibits the characteristics of exhaustion or "neurasthenia" not dependent on physical disease, and who also illustrated, in the history of his treatment, most of the theories that have been held on the ætiology of typical neurasthenia or "nervous exhaustion" in the past 30 years.

He was an army officer who, while serving in the East during the last year of the last century, suddenly complained of malaise, was diagnosed as suffering from malaria, and took to his bed.

During convalescence, from what appears to have been a mild attack, he found that his legs were very weak. The weakness persisted to such an extent that even after some months he was unable to return to duty. "Nervous exhaustion" was diagnosed, and he was ordered a complete rest on Weir-Mitchell lines, after which it was found that though he had more use of his legs he was readily fatigued. On some occasions he bicycled 20 miles, but always suffered terribly afterwards and had to remain in bed, exhausted, for several days. He consulted an eminent authority of the time, who said that he had "spinal neurasthenia," and added that neurasthenics differed entirely from hysterics in that they always tried to conceal a real disability while hysterics made the most of an imaginary one. Following this the patient spent some years in and out of nursing homes for periods of rest, which would serve for a time, but always the fatigue returned.

The next outstanding episode in treatment followed a new diagnosis of endocrine, and especially adrenal, insufficiency. He now received injections of adrenaline, especially before making any unusual effort which he felt inclined to make in a social way. After a time these injections lost their stimulating effect, and various other endocrine preparations were tried in turn, without however even temporary effects this time. It was then suggested that the postulated endocrine deficiency was secondary to an intoxication of intestinal origin. The stools were cultured accordingly, an organism isolated, a vaccine made and injected, and the bowel irrigated. Again there was a temporary effect. In 1925 focal infection was suggested, and his teeth were removed practically wholesale with no lasting result.

In 1927, when he came under my observation, the weakness and fatigue were worse than ever, and he could hardly walk across his bedroom. It was now nearly 30 years since he began to suffer from his neurasthenia. He had done no work in his profession during that time, having, in fact, resigned long ago, but he had taken up a part-time job which he conducted from bed. Organically he was sound, and in fact very well preserved for a man of 60. Investigation of his mental attitude revealed a very unhappy man who had loathed his profession from the beginning; even his Sandhurst days had been a misery to him.

The treatment here consisted in :—

1. A careful physical examination.
2. A systematic and chronologically detailed history of the symptoms in relation to the patient's personal history, career, and so on.
3. An explanation to the patient that (*a*) he had no physical disease, but (*b*) that his symptoms, however, were not nothing; that they were real and must have some definite cause.
4. An explanation of the effects of the emotions on the viscera, especially in producing fatigue. Everyone knows that worry, to take the commonest example of an emotional state, is extremely fatiguing, and I know no two symptoms that go oftener together than fatigue and depression of spirits.
5. The effect of false inference—i.e., that the fatigue was due to bodily disease and not therefore avoidable by him—in perpetuating his symptoms and in making him expect to feel tired, was pointed out.
6. He was then encouraged to increase his activity not gingerly by inches, but by leaps and bounds. As there was nothing physically wrong with him, and only his own misconception and discouragement based on this prevented him from being perfectly normal, he could walk as far as he pleased. And this he did, after 30 years of semi-invalidism. For the next five years he remained active, and then for a time relapsed, but not with his former symptoms. This time he was mainly depressed about his life and circumstances, as indeed he had reason to be.

This sounds a long process but it can really be quite short. I have known it to be compressed into a single interview of little more than an hour, even in a condition of as long duration as the one I have mentioned.

A particular instance in a man of science showed well how a particular emotional experience, if its effects are misunderstood at the time, can produce a chronic psychoneurotic symptom very resistive to ordinary treatment.

This was a man of middle-age who complained of "brain-fag," which took the form of inability to read for more than about 40 minutes at a time. He then had to rest for half an hour befor he could resume. This had handicapped him considerably in his work for examinations which had been essential to his scientific career. We investigated the history of the symptom in a straightforward, chronological way. It had first appeared 30 years or more ago, when the patient was about 13. At that time he was taking some of his work in classes from the headmaster of his school, whom he disliked very much. The headmaster remarked to his mother that the boy had an under-developed brain, and the mother had injudiciously communicated this to the boy. The latter, although doing well in his other subjects, believed this, and noted anxiously that he gained weight in the summer and lost it in the winter. He concluded that this was the result of overstrain of his "under-developed brain," and so he became afraid to read for more than a certain period of time. In his fear he automatically assumed that he would become fatigued after this period, and it had become a habitual fear producing the effect long after the reason for it had been forgotten.

When he remembered all this, as he succeeded in doing after an hour and a quarter's effort by the patient and myself, he naturally asked what was to be done now? What he had ventilated had surprised him a good deal—so much so that I felt it was a "true bill," and advised him to proceed forthwith to the nearest technical library and read there for at least two hours. This was on Friday. I asked him to return to me on the Monday. He appeared looking rather sheepish, and admitted that he had now no difficulty in working for as long as he pleased. The therapeutic process here was simple enough. It insisted on an accurate chronological history of the development of the symptoms; a physical examination, an assurance based on the latter that a physical cause was out of the question, and then an inquiry into the history of his life as distinct from the history of his symptoms, but focusing especially round the time of their remembered origin. The entire process took an hour and a quarter, and cleared up a symptom which had troubled him for 30 years. This would have been impossible if the patient had not been highly intelligent and keen to get well.

The key to the successful treatment of a case of nervous exhaustion is not to tell the patient that he has nothing the matter with him, which is palpably false; but to explain how emotional factors can cause fatigue, and then to demonstrate their existence in his own case. In exhaustion of this kind rest has no place in therapy; it is, in fact, contra-indicated as definitely harmful. But there are certain cases of exhaustion without existing physical lesion and with symptoms similar to those of the sort described, such as insomnia, irritability of temper, hypersensitiveness to noise, and the like. This is the "hyperæsthetic-emotional state of weakness" of German authors, and is distinguished from the former principally by the history, which contains real and definite overwork, or such causes of severe physical debility as parturition or acute infection. That the overwork has been real it is important to establish, for many a neurasthenic pleads overwork as an honourable occasion for his breakdown; but real overwork means something of the nature of sewing shirts until 10 P.M.

every day and on Saturdays and Sundays as well, as in the case of an out-patient seen at Guy's recently. In the instance of another woman, also an out-patient, it meant nursing four children through an infectious illness, bearing a fifth in the space of the same few months, doing all the housework, and sleeping little.

The symptoms in both these cases were difficult to distinguish from neurasthenia of emotional origin. They did, in fact, result partly from an anxiety based on the fear of incapacity for work and responsibilities. Nevertheless, even in patients with a history of recent physical stress, it is wise if they present symptoms with an ambiguous look to inquire into the more personal aspect of their lives. I recently felt fairly sure with a woman patient that she was suffering from a "hyperæsthetic-emotional" type of disturbance resulting from real overwork in her home and with her ailing children, until I discovered that she was all the time miserably unhappy with a drunken husband.

There is another possibility of error here. A history of an acute illness is by no means decisively in favour of an ætiology of a fatigue syndrome that is principally physical. Sometimes the post-febrile weakness and debility perpetuate themselves as suggestions of weakness. The convalescent patient does not always realise that he has fully recovered.

For example, I remember a pioneer airman who, crashing badly, retired permanently from flying but recovered his health completely. The retirement, however, left him with nothing particular to do. Several years later, in 1923, he had an influenzal pneumonia from which he ultimately recovered, only to find even after a year's convalescence that he could only take a very limited amount of exercise. This limitation persisted for about four years until I examined him in 1928. I found a very healthy and well-developed man, and told him so. He replied that it was very odd that he could walk no further than 300 yards without extreme fatigue. I removed him temporarily from his wife, who was a little older and mothered him too much. I encouraged him to believe that he was physically quite well, and that he could do anything he wanted to if he would only believe it. It took three weeks to convince him of this, but at the end of that time he was living a natural life, playing all the games, such as golf and tennis, that he formerly enjoyed, and taking part in amateur theatricals.

Here again the treatment and its success depends on an accurate analysis of the history, not only of the disease, but also of the personal circumstances; and especially, in this particular case, of the temperament, which was an over-anxious one. I believe that an accurate history, coupled with an ordinary but complete clinical examination, is of far more value in the diagnosis of disease in general, and consequently in treatment, than test-meals, X rays, measurements of blood pressure, or bacteriological examinations taken singly or together, and there are many clinicians in other branches of medicine who agree with me. Alvarez's recent book on nervous indigestion comes to the same conclusion, and Alvarez is a physiologist and a clinician. It is not that laboratory methods do not have their value, even in the treatment of psychoneurotics. There is nothing more convincing, in a superficial way, to some of them, than a negative radiogram. Not the most vehement assurances of the most impressive doctor carry more weight than that. But X ray photographs are expensive methods of reassurance, and they serve at best only to lessen preoccupation with a particular symptom.

Anxiety Neuroses

The second and by far the largest group of so-called functional nervous conditions is the one usually designated, not very accurately, as an anxiety neurosis or, more accurately, a psychoneurotic anxiety-state, and by Freud as anxiety-hysteria. It must be one of the commonest conditions seen by any doctor, and it has a multitude of symptoms. Usually, many of these symptoms are gathered together in one patient. They may implicate any or all of the bodily systems, but usually the patient tenders only one or two. The rest can usually be elicited by questioning him, and the fact that symptoms are found to exist with regard to practically every system in the body, is almost diagnostic of the condition, although not a necessary mark of it. The complaints are uniform enough from patient to patient to enable some of them to be regarded as typical; and they have sufficient resemblance to the effects of bodily disease to give rise to a frequent possibility of error. In the cardiovascular system they usually include palpitation and præcordial pain; in the respiratory system shortness of breath usually, less often cough, or difficulty in getting a breath, sometimes mistakenly described as "asthma"; in the nervous system, headaches in the form of pain in the head or a band round the head, tremblings, insomnia, fatigue, nightmares, and paræsthesia such as numbness or pins and needles; in the digestive system fullness in the stomach, flatulence, vague pains in the abdomen, vomiting, and diarrhœa; in the genito-urinary system, frequency of micturition or inability to micturate under certain circumstances, dyspareunia, spermatorrhœa, and premature ejaculation.

The differential diagnosis from organic disease is sometimes difficult. In the absence of any very definite physical signs one should always think of the statistical probability of a psychological origin for such symptoms as those above mentioned. The history is the main thing, both from the diagnosis and as a basis for treatment. A knowledge of the natural history of clear-cut organic disease is invaluable, and usually the history of the symptoms in the anxiety states is very different from that of the organic diseases they suggest. If the symptoms are cardiac then the dyspnœa arises as much apart from exertion as with it, even at rest or in the middle of the night, and præcordial pain is common and persistent. If the symptoms have an alimentary reference actual pain does not occur, or if it does, has no relation to food and is indefinitely localised as a rule and changes its position frequently.

For example, a man of 47 complained of pain when he awoke in the morning, and discomfort when he went down to breakfast which was completely relieved while at breakfast, but was replaced by pain again after half an hour's rest after breakfast. This was followed by relief till lunch, after which "the real thing" began and lasted till bedtime. This is not like the history of pain belonging to any of the organic diseases of the stomach.

The mental attitude is one of anxiety but the patient may not mention this. He fears that there is something the matter and usually something serious. The fear most commonly present, and one that he mentions last if he does put it into words at all, is the fear of insanity.

Everyone knows that an examination and reassurance that there is nothing wrong is sometimes all the treatment that these patients require; but frequently after this process they relapse or go elsewhere. Sometimes they go away discontented from the beginning with the assertion that it is nothing. Obviously there must be something, they think, or they would not have symptoms like these. They are quite right. They have something only it is not what they surmise. The next step after a negative physical examination is to give an explanation why the symptoms nevertheless exist. It has to be explained what the general public brought

up on a purely physical conception of disease does not realise; that one's thoughts and feelings can affect the functions of one's viscera. People learn in a general way that fear makes one's knees tremble, but they do not realise how readily fear can make one's heart beat more forcibly and one's peristalsis cease or actually reverse itself. It is easy enough to give them chapter and verse for these facts, and it is best to choose as vivid and impressive instances as possible, proceeding, however, from simple examples such as the fear and knee-weakness sequence. One of the most telling I find is the story of the experiment in which a window is made in a cat's abdomen and then after the anæsthetic has been recovered from, a dog is exhibited to the cat. Peristalsis ceases absolutely. Examples from real life are common enough. The effect on the lower bowel on going over the top in the late war was well known. For more s[illegible]ish patients examples are most easily found in [illegible]rature of antiquity. Joseph's bowels yearned upon his brother Benjamin, and in the first epistle of John the "bowels of compassion were shut up." Sennacherib thus describes his battle with the two kings of Elam: "The vehemence of my battle line[illegible]s a bull overwhelmed them. To save their lives they trampled over the bodies of their soldiers as they fled. Like young captured birds they lost courage. With their urine they defiled their chariots and let fall their excrements" (quoted by Cannon). The *Dulce et decorum* ode contains a reference to the *poplitibus trementibus* of the less ardent youths. The common phrases "a heavy heart," "cold feet," and a "lump in the throat" all are founded on the observation of definite psycho-physiological occurrences.

There are quotations and instances to suit all tastes. The physiological and clinical literature has many examples, ranging from the increase in the reducing power of the urine in a diabetic who has become worried, to the change in the loudness of the bruit in a cavernoma angioma within t[illegible]cranium when the patient thinks hard. I had young woman patient who vomited every time young man made love to her, and who nearly [illegible]ed of acidosis during her engagement. Alvar[illegible] gives some good examples:—

"When I was studying the intestinal movemen[illegible] of a man with an opening through the abdominal wall into the first portion of the small bowel, a small balloon connected by rubber tubing to a tambour was passed into the [illegible]wel and with it I was able to record every movement that [illegible]ook place. As I sat by the bedside watching, I noticed a su[illegible]den rise in the level of the tracing and an increase in the amplitude of the contractions and looking about for some cause I heard the rumble of the steam table as it came down the hall bearing the patient's luncheon. He was hungry and had heard it first. This sudden increase in the activity of the bowel coincident with the arrival of luncheon was observed on two occasions.

"The most striking evidence of a psychic increase in tone and activity was seen in a jolly *bon vivant* whose anal sphincters had been destroyed by a series of operations for fistulas. As a result many of the rush waves down the bowel, instead of stopping, as they normally do at the ileocæal sphincter or somewhere in the colon, ran on and produced a bowel movement. The interesting point is that in this man the sight and smell and even thought of food produced rushes. They were most annoying at breakfast-time, when after the night's rest the bowel was most sensitive, and as a result he had to eat his breakfast in the bathroom. Ordinarily, except for meal-times, he had little difficulty unless, perhaps, when passing a restaurant he happened to catch an appetising whiff of food, or unless some practical joker among his cronies, knowing his infirmity, began to discuss before him the relative merits of Hungarian goulash and beefsteak and onions. He knew the site of every restaurant in town and never went near one if he could help it."

Sometimes a general explanation along these lines is sufficient to send the patient away permanently satisfied. Very much more often it is necessary to find both particular and general cause of the constitutional upset, and this may be, but is not necessarily a prolonged business.

For example, a certain patient was described as "a queer mixture of shrewdness and ability and of stupidity over symptoms." He complained of indigestion which began in 1920; he was operated on for appendicitis, and afterwards tubercle was diagnosed. He was treated successfully in a sanatorium, and was warned that if he ever allowed his stomach to get out of order it would give an opening for tubercle to flare up. A diet was recommended, he stuck to it, remaining well till his wife fell ill in 1927 and underwent an operation. A week after this he developed a severe abdominal pain of a type that had no relation to meals and was very curious in its time incidence. He was given a long interview, the significance of the commencement of his symptoms at a time of emotional stress was explained to him, and the part played by his anxious temperament and the impression made on him by previous diseases was made clear. He departed apparently satisfied; at any rate, his doctor reported that he never complained again.

The short procedure is to get a history of the development of the symptoms and to focus one's attention round the time of their origin. In most cases it is possible to find factors of a distinctly personal and emotional nature by diligent search, operating at the time of the outbreak of the symptoms. Often it is a matter of the climax of troubles which have been accumulating for some time, but the things that determine the actual outbreak of symptoms at that particular moment is sometimes apparently trivial.

A young woman with attacks of trembling, palpitation, and dizziness, related that they first occurred six weeks previously. She denied a special worry at that time. On going into details we found that she had the first attack while watching a moving picture. She was accompanied at the time by a girl friend with whom she was on perfectly ordinary terms. Nothing had occurred that day to disturb her. Questioned as to the subject of the moving picture, however, she mentioned that at the moment she fainted the heroine on the screen was contemplating suicide. Only then did it emerge that the patient herself had had similar thoughts recently, and this led to an admission of what she had previously refrained from talking about—namely, the presence of a personal conflict revolving round a disappointment in love.

Not only does the discovery of a personal association of this sort give point to one's general explanations to the patient; it leads to the transfer of the patient's interest from the symptoms to the personal difficulties underlying them. The treatment then ceases to be symptomatic and gets down to causes. For this reason, although one has to treat many neurotics with symptoms in many systems—e.g., in the digestive system—one seldom has to treat the symptoms as such. It is neither necessary nor wise to prescribe bismuth or HCl or whatnot in the absence of definite physical indications. There are certain general lines of search that are useful in patients who have to be treated rapidly.

They are in the case of adults: Financial affairs, relationships at work (attitude of employer and fellow employees, rates of pay, chances of promotion, liking for work), domestic affairs (relationships to husband or wife or others, especially parents living in the same house), marital difficulties (temperament as well as actual sex relationships), attitude about children, the question of further pregnancies, unwanted pregnancies, &c. The domestic problems are the most important but professional and business relationships, especially the suitability of a job and chances of promotion, play a larger part than is generally realised. In young unmarried people one asks about the attitude of parents, brothers, and sisters, the hours of work, the choice of a career, type of

recreation, and if it seems necessary, the attitude to marriage and to sex itself. Systematic inquiry along these lines can rapidly be pursued with hopeful results if the replies are carefully watched and the manner of giving them, especially negative replies, carefully scrutinised. Often a slight change of expression will denote to the practised observer a hedging on some of the topics touched upon.

"Vasovagal Attacks"

There is a subvariety of anxiety attacks called "vasovagal." There is as much scientific justification for supposing them to constitute a nosological entity as there is for setting apart tachycardia as a disease. The suggestion has been made that vasovagal attacks are a form of epilepsy and some such attacks doubtless are, but in many there is a good deal of objection to classifying them with epilepsy. The vasovagal syndrome is simply a pattern of reaction which may be touched off by a variety of factors from a domestic fracas to a neoplasm of the medulla. The central features of these attacks are a general disturbance of a type suggesting vagal stimulation and a subjective sense of impending death. A sense of constriction in the chest, cardiac inhibition sometimes to the extent of syncope and abdominal pain, are among the principal symptoms in addition to the "angor animi."

The disappearance of these symptoms following simple psychotherapy is sometimes astonishing.

There was some time ago a woman admitted to Guy's with a history of two years' duration of such attacks. She experienced a paræsthesia or numbness involving the left side of the mouth accompanied by a feeling of difficulty in breathing, præcordial pain, and abdominal discomfort with diarrhœa. The "angor animi" was marked. In addition it was stated by her family that her lips went blue during an attack. She was a young married woman without children, and had in consequence of her attacks been advised that she must not have any. It soon became evident that she was very depressed and a few further questions elicited the fact that she was very fond of children, that she was alone most of the day, and that her husband while amiable was a quiet sort of person. On going into the history of the symptoms it appeared that they had begun suddenly while she was on her honeymoon, on the third day of it precisely. It is often unwise to broach such subjects at a first interview, but in this case it did not prove difficult to discover that the honeymoon had been unsatisfactory; there had been attempts at coitus, but for some reason they had not succeeded by the third day and it was on that day during a further attempt and failure that the first attack occurred. The situation and attacks persisted, and a doctor had been consulted who advised that she was unfit to have children and must remain so for at least two years. I wrote to her doctor and asked him to explain to her that the symptoms had originally been provoked by anxiety and frustration and perpetuated by misunderstanding, and that as far as the symptoms were concerned she could have children as soon as she pleased, in fact, the sooner the better. She recovered immediately—she never had another attack. The whole story had been elicited in half an hour.

It cannot be too much emphasised that such rapid results, I would call them as a rule considerable improvements, rather than recoveries, are uncommon; but the fact that they can be achieved at all after so many years suggests, although it does not prove, that earlier treatment such as the general practitioner has the opportunity of giving, may be effective in a much larger proportion of cases than this.

I give these as examples of what anyone with a systematic procedure and some determination can do in treating the commonest types of nervous conditions in general practice without necessarily having to expend a great deal of time. The latter is often necessary, however, in the chronic psychoneurotic whose history of symptoms dates back many years in those with phobias of trains, buses, closed or open spaces, &c., and in many of the depressed type. The simple rules I have given serve, however, for the brief type of treatment.

Hysteria

The treatment of hysterics is along similar lines as regards preliminaries, but gross hysterical disabilities, like paralysis or blindness, allow aggressive methods of actual treatment, as A. F. Hurst has shown. A hysterically paralysed limb is as a rule a very satisfactory object for the psychotherapist; although I have known some that remained paralysed in spite of his best efforts. But a disability of this sort is a far more tangible affair than is usually encountered in psychological medicine which is so full of impalpables. One can make the symptoms change and let the patient see it change in an objective way. This enables a much more rapidly convincing method of persuasion to be employed than is possible with psychoneurotic anxiety states. An example will make my meaning clearer.

A girl of 20, who had been a stage dancer, was referred to me by my surgical colleague, Mr. W. H. Ogilvie, who had diagnosed a hysterical hip. Six years previously she had slipped and fallen during a performance, and after that had complained of pain in her knees and subsequently in her hip. She had not walked since that time and had received many treatments. She had had a semilunar cartilage in both knees excised, but latterly at least the condition had been considered tuberculous, and she had her hip immobilised at various times in extension or plaster or splints. Ultimately when she came under Mr. Ogilvie's notice and mine she was wearing a patten on the foot of the affected limb, and walked with the aid of a heavy stick. Her left leg seemed on casual inspection to be shortened, and she leaned heavily over on the same side while standing. When walking she lurched violently over on her left side and held her left knee stiff. She complained of pain in the left hip especially, but also in the right hip and both knees. In the recumbent position no deformity or wasting was noticeable and no shortening.

The treatment consisted first in explaining to the patient that there was no physical disease, that she would walk normally if she could get back her confidence in doing so, and that we would teach her how it could be done. The second part of the treatment could be described, if one wishes in rhetorical terms, as persuasion and re-education. It consisted actually in having the patient walk up and down until she was walking practically normally. This took two hours and a half but it was worth the effort, and she emerged cured of her disability. My house physician and myself took it in relays to go on persuading her that she could walk normally and in getting her to do so.

Of course such treatment cures only the symptom. It does not necessarily cure the disease. But in a number of hysterics cure of the symptom is nearly all that is required, and at least to have begun by curing such a disabling symptom gives the therapist a valuable jumping-off ground for the rest of the treatment, which in some cases necessarily includes a prolonged and very technical form of psychotherapy. With the patient just described, the rest of the treatment was simple and not highly technical. It involved re-educating the family to a belief that the patient was really fit so that they might cease fussing about her; in helping the patient to an occupation in life—her business in life during the past six years having been the haunting of hospitals—and in helping her to a more grown-up, less child-like attitude than she had yet attained.

The methods of psychotherapy I have described require no special apparatus, but they require perseverance and accurate investigation and a willingness to spend a reasonable time soon after the patient first presents himself. By these means much time may be saved the practitioner in the long run; he himself will gain much credit, and the patient be saved much misery, grievance, and loss of time.

THE MODERN CONCEPTION OF NEPHRITIS,

AND ITS BEARING ON CERTAIN PROBLEMS OF LIFE ASSURANCE *

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ALL those who have been engaged in the active practice of medicine during the last 20 or 30 years must agree that there has been an astonishing change in the precision with which a diagnosis can usually be established. However much one may reverence the experience and clinical instinct of the great physicians of the last century and the epoch immediately preceding the war, it would be foolish to pretend that they were capable of identifying and classifying disease in a manner in any way approaching what is possible to-day. If we reflect on what would happen during a teaching round in a medical ward before the war, we remember most brilliant teachers arriving at conclusions which were often accurate as regards the broad nature of the disease, and not infrequently genuinely precise when the post-mortem room revealed the ultimate details, but the contrast between this and a visit to the wards of a modern hospital is really very great. To-day you will go to such a ward and see, for example, a series of cases of this description—an ulcer on the lesser curvature of the duodenal cap, a case of pernicious anæmia, with the blood nearly restored to normal but with subacute combined degeneration of the cord, a case of pulmonary tuberculosis with the disease confined to the right apex, a case of sacro-iliac strain, a case of carcinoma of the fundus of the stomach, a case of tetany due to chronic steatorrhœa, a case of hypertensive cardiac failure with auricular fibrillation, a case of dysphagia due to achalasia of the cardia, a case of diverticulitis with recurrent pain and pyrexia. These are everyday cases, and the point which I wish to emphasise is that you will find precise diagnosis established in every one of them to-day, whereas 15 years ago this was not possible, at any rate as a rule.

I do not wish to imply that this is entirely due to laboratory methods and the help of X ray examination; it is very largely due to these things, but actually precision is often reached to-day through the more exact knowledge which experience, gained by the help of these ancillary services, has given us.

Knowledge of Nephritis

When we come to nephritis it must at once be admitted that there are, in spite of the brilliant work of a host of investigators, enormous gaps in our knowledge which prevent us from achieving that precision which exists with regard to many other common diseases. Anyone accustomed to survey the world's literature dealing with nephritis is aware of considerable divergence of opinion, sometimes between country and country, and even more often between different authorities in the same country. At the same time, I would suggest to you that the last five years have seen the emergence, in many different countries, of an important agreement concerning the major aspects of nephritis amongst a body of workers who have studied the subject deeply, sometimes in collaboration, sometimes independently. These workers, amongst whom I would include Fishberg, van Slyke, Epstein, and Addis in the United States, Achard in France, Volhard and Fahr in Germany, Snapper in Holland, and Gainsborough and others in this country, are steadily reaching close agreement as to the classification of nephritis, both as regards its clinical course, its ætiology, its morbid anatomy, and its biochemical manifestations, and although I think not one of them would suggest that anything approaching finality has been reached, they nevertheless represent an agreed conception concerning the general features of nephritis which is something quite new in the long history of medical inquiry into this subject.

I cannot put before you more than a somewhat fragmentary outline of the major points in this conception, but some of these will, I think, be of value in deciding when, and in what manner, a person with a history of nephritis, or with evidences pointing to nephritis, can be accepted by the examiner for life insurance.

Renal Failure

The first conception to which I would draw attention is that of "renal failure." By this we mean a condition in which so great a proportion of the total kidney substance is temporarily or permanently out of action that the physiology of the body is deranged.

The normal kidney is made up of a vast number of individual units, each of which begins in a glomerulus; nature has provided far more of these units than are essential for life; it is a common observation that half the total kidney substance—i.e., one of the two kidneys—may be lost without permanent impairment to health, and we know that actually between two-thirds or three-fifths of the total kidney substance must be out of action before renal failure is established. A useful analogy may be drawn between renal failure and cardiac failure; each of these conditions may be temporary or permanent, and each of them may be compensated or decompensated. Just as toxæmia may produce acute cardiac failure from which the patient ultimately recovers, so an acute nephritis may produce a condition of renal failure which is not by any means necessarily permanent or fatal. As regards compensation, the analogy is less exact because long-standing compensated renal failure is a much rarer phenomenon than compensated cardiac failure, and is seldom compatible with prolonged good health.

The conception of compensation and decompensation in renal failure depends on recognising that the main function of the kidney is the elimination of those superfluous chemical products which are found in the urine, nitrogenous matter, particularly urea, being the most important. In order that the elimination of these bodies may be accomplished with a minimal loss of water the kidney has the power of concentrating many of them in such a way that normal urine exhibits an enormously greater concentration of urea than does the blood. The damaged kidney shows its failure first of all by a loss of this concentrating power; it still succeeds in eliminating the daily quota of urea and other substances, but can only do this by pouring them out together with considerable amounts of water. In consequence of this we have polyuria as the first sign of renal failure, and this polyuria is a compensatory process because the kidney is still fulfilling its major function of maintaining the blood chemistry practically constant.

* A communication to the Assurance Medical Society on Nov. 2nd, 1932.

If renal failure persists the kidney becomes unable, even with the aid of increased water excretion, to rid the blood entirely of excess of urea. Uncompensated renal failure is then present and change in the blood chemistry can be demonstrated, this change being most often in the form of an increase in the urea and non-protein nitrogen. The following Table represents the main findings in compensated and uncompensated renal failure :—

—	Renal failure.	
	Compensated.	Uncompensated.
Urine { S.G. .. .. / Urea	Never above 1020. Below 2 per cent.	Seldom above 1015. Below 1·7 per cent.
Blood	Urea below 40 mg.	Urea 40–300 mg. N.P.N. 40–300 mg.
Symptoms	Polyuria.	Polyuria. Gastro-intestinal symptoms.

It must next be emphasised that renal failure is a disturbance of function which may occur in any form of renal disease. It may occur during an acute nephritis or as the termination of a chronic nephritis, or it may occur in such conditions as damage to the kidneys from prostatic obstruction, polycystic disease, or tuberculosis of the whole urinary tract. It is a clinical state and not a disease in itself, and the prognosis, when it is present, depends on the disease causing it and the therapeutic possibilities which such disease may exhibit.

Uræmia and Pseudo-uræmia

The understanding of the conception of renal failure is important because it is now considered that uræmia is explicable by the ancient conception of Bright—namely, that it is a chemical intoxication largely due to the accumulation of urea in the blood. For several generations this conception has been rejected because of the frequency of persons dying with obviously diseased kidneys but without any notable increase in the concentration of urea and non-protein nitrogen in the blood. Observers therefore sought for some toxic substance other than urea which might be the principal agent producing uræmia, and it was commonly believed that nitrogen retention, when present, was merely an index of disordered blood chemistry, and that the unknown toxin responsible for uræmia might be present in the absence of these other signs. To-day it is believed by the group of workers to whom I have referred that the term uræmia should be reserved solely for those cases in whom there is gross nitrogen retention. We recognise a condition of compensated renal failure in which there is a normal blood chemistry maintained by the mechanism of polyuria ; we next recognise a condition of uncompensated renal failure with polyuria but with an increasing concentration of urea and other chemical substances in the blood ; and, finally, we recognise a condition of true uræmia in which the blood-urea has become enormously elevated, giving figures always above 150 mg. per 100 c.cm. and usually in excess of 200.

This condition of true uræmia is characterised by gastro-intestinal disturbance and deepening coma. Other manifestations, air-hunger, twitching, and so forth, often accompany it, but these are not essential ; they are the results of varying secondary changes in the blood chemistry, such as lowering of the alkali reserve and hypocalcæmia. If I were asked for the most characteristic clinical sign of true uræmia I would say that it is the occurrence of a metallic or ammoniacal taste in the mouth due to the presence of large quantities of urea in the saliva, and not infrequently recognised as such by the patient.

If this is true uræmia, what is the explanation of the many fatal cases of coma without changes in the blood, but with obvious renal disease at autopsy ? The answer is that these latter are examples of pseudo-uræmia in whom renal disease is accompanied by changes in the cardiovascular system, and that it is this cardiovascular change which produces cerebral effects leading to coma and death. It is often a matter of considerable difficulty to distinguish between the two groups on clinical examination alone. The pseudo-uræmic group is always characterised by elevation of the blood pressure, whilst the evidences of chemical derangement are slight or absent. The fact that these cases are dependent on changes in the lesser arteries and on diminution of the blood-supply of the brain leads to the fact that changes in the retina are present in most of them, chemical changes in the blood and urine are not conspicuous and may actually be absent. In true uræmia, on the other hand, there may be no elevation of the blood pressure at all, eye changes are often absent, but examination of the blood invariably discloses the true diagnosis.

From the therapeutic standpoint the distinction between these two conditions is of the utmost importance, because in true uræmia the indication is to adopt measures such as protein starvation which may alleviate the chemical condition of the blood, whereas in pseudo-uræmia it is of cardinal importance to bring about a change in the cerebral circulation as rapidly as possible, and venesection, lumbar puncture, and the intravenous administration of hypertonic solutions often become of critical importance. A. M. Fishberg, of New York, who has done so much invaluable work on these questions, has also been responsible for the introduction of many felicitous terms which enable us to understand the modern view. He refers to the cerebral manifestations of high blood pressure as "hypertensive encephalopathy" and he would have us speak of "hypertensive retinopathies" in all those conditions where changes of the retina occur in the course of disease or the cardiovascular system include those examples where the kidney is also involved. Surely this is a change well worthy of general adoption. At a time when we know full well that the group of cases in which albuminuria is most conspicuous, that is to say in the nephroses, retinal changes are never observed, it is ridiculous to retain the term "albuminuric retinitis" for a condition which clearly has no necessary connexion with the presence of albumin in the urine.

The Classification of Nephritis

I have felt it necessary to bring before you the above considerations concerning renal failure and true and false uræmia before discussing the classification of nephritis, because I feel that a clear conception of these states is essential for an appreciation of the classification of nephritis which is becoming evolved largely as a consequence of such doctrine.

I hope that I may be forgiven if at this point I interpolate a brief account of classifications of nephritis which have found many adherents in the past, some of which are current at the present date.

It is impossible to approach the subject of classification without reference to the past, and I must

remind you that Bright was exceedingly cautious in avoiding any hard-and-fast differentiation into groups. Study of the medical history of the last century indeed emphasises the lack of uniformity in teaching, although it was perhaps unfortunate that in the absence of unity of conception individual writers tended to be dogmatic in dividing renal disease into various groups. It was largely as the result of the work of Wilkes and of Bartels that it became customary to distinguish two main varieties of chronic nephritis to which were attached the terms "chronic parenchymatous nephritis" and "chronic interstitial nephritis," the former being essentially a condition characterised clinically by dropsy and albuminuria, and the latter one in which there was a small contracted kidney in a patient dying of uræmia or cerebral hæmorrhage without œdema. The supposed occasional transformation of a case belonging to one group into a condition which flung him into the other group has been the cause of bewilderment and despair to generations of medical students. Many names, such as those of Gull and Sutton and of Weigert, might be quoted amongst the pioneers who exposed the futility of this classification; their voices were unfortunately not heard, although the rapid growth of histological inquiry soon made it apparent to the pathologist that there was no justification for the acceptance of it.

The first decade of the present century saw the genesis of a "functional" classification of nephritis which originated in France following the revival of biochemical investigation, chiefly as the result of the observation of Widal and his school. This school sought to divide Bright's disease into a group of patients in whom the damaged kidney was unable to excrete nitrogenous substances and hence produced uræmia, with, in opposition to this, a group in which the disease produced failure to excrete chlorides and other salts and hence produced œdema. At the present time it is unnecessary to say very much concerning this classification beyond that it had a transient value in focusing attention on biochemistry, and that the course of time has amply demonstrated not only that many patients could be placed in both groups simultaneously, but that modern biochemistry has rejected the theory that there is a type of kidney essentially incapable of excreting chloride.

To-day we are approaching a classification which has a sound basis of morbid anatomy and is also compatible with the various clinical manifestations of nephritis. Admitting that the widespread body of observers to whom I referred in the opening paragraphs of this paper have not yet reached agreement as to details, it is becoming more and more generally recognised that three great groups are to be distinguished. Of these the central group is constituted by the true inflammatory diseases of the kidney following acute infections. This great group of glomerulo-nephritis may be subdivided into a relatively benign group in which scattered foci of inflammation arise during an acute infection, and a second group in whom the inflammation is spread diffusely through both kidneys. This latter subgroup includes all those serious cases of nephritis which, beginning usually as a streptococcal infection, are seen again and again in the medical wards of the general hospitals, and eventually terminate fatally, usually after a very chronic course. In very severe cases the initial effect may be so tremendous as to produce renal failure and death from uræmia. More often an œdema of gradual onset is accompanied by a slowly rising blood pressure, and after waxing and waning for long periods tends to subside as renal failure slowly appears. Death will occur from true uræmia or from cerebral hæmorrhage or from pseudo-uræmia, according as the factor of glomerular destruction or of increasing hypertension is predominant. (See Figure.)

Now in sharp opposition to this great group we recognise two other groups which have little if anything in common either with one another or with true inflammatory nephritis. The first of these is that which has been called "nephrosis." Here we have, clinically, an intense albuminuria, with or without œdema, but without either marked hæmaturia, increase in blood pressure, changes in the retinæ, or any tendency to uræmia. On the histological side we recognise the association of this group with kidneys showing no evidence of change in the glomerulus, but changes, purely degenerative in character, in the renal tubules. The recognition of this group is due largely to the work of Epstein, and if at the present day there is a tendency to reject his belief in the invariably benign character of nephrosis, it remains true that the prognosis in many examples is relatively good. Perhaps the most important lesson from his work has been that whereas even five years ago there was a tendency to say that renal œdema was an entirely mysterious phenomenon, it is now becoming agreed in all quarters that diminution of the density and osmotic capacity of the blood-plasma, following leakage of albumin into the urine, is the mechanical factor responsible for the production of renal dropsy. Examples of nephrosis are to be found in cases where the kidney has been damaged by the accidental or suicidal administration of mercurial poisons; another group is that known as lardaceous disease; but many cases have been reported arising apparently spontaneously. The great difficulty concerning nephrosis is that a certain number of these latter cases are found, with the passage of time, to develop hypertension and renal failure. These are examples which probably have been mistakenly diagnosed at the outset, being really cases of diffuse glomerulo-nephritis in which the initial glomerular damage was so slight as to escape recognition.

Diagram to illustrate the varieties and clinical phenomena of nephritis. Sub-varieties of glomerulo-nephritis are indicated. Shaded area = albuminuria; stippled area = hypertension.

At the further extremity of the scale we find another main variety, contrasting vividly with nephrosis and constituting the third of the great main groups of renal disease. This is the division which includes all those cases in which the kidneys are damaged by changes in their blood-supply following some generalised vascular degeneration. Perhaps the best name to give to this group is "ischæmic nephritis." The outstanding clinical manifestation of these is hypertension, the outstanding feature of their morbid anatomy is sclerosis of the kidneys and spleen, with

hypertrophy of the heart. Several subdivisions of this group are becoming recognised, but I do not wish to complicate the story by entering into fuller description of these beyond saying that far and away the most frequent cause of ischæmic nephritis is that mysterious condition which we speak about as "essential hypertension" or "hyperpiesia." I cannot too forcibly remind you that death in this group arises far more frequently from cerebral catastrophe or from cardiac failure than from renal failure; many authorities have stated their conviction that less than 10 per cent. of all such patients die of uræmia and renal failure, but many pathologists, finding in the post-mortem room a body with conspicuously shrivelled kidneys, incline even to-day to group all such cases as "chronic interstitial nephritis." Very brief histological examination of other organs, such as the spleen, should be sufficient to demonstrate that to regard such cases as primary diseases of the kidney is to fall into grave error. Sir William Gull, many years ago, had occasion to question the conception of the great Bright in this respect. Lecturing on some preserved specimens consisting of a large heart and two contracted kidneys, he said that not these alone but the entire man should have been included in the vase.

I do not wish it to be supposed that there are no clinical difficulties as regards the allocation of certain cases to this last group. True inflammatory disease of the kidney may be so insidious in its onset, and may be accompanied by such widespread arterial change, that hypertension is altogether predominant in the picture, but for every case of true chronic nephritis of this type there are probably 50 in which primary arterial disease is mistakenly classed as chronic interstitial nephritis.

Nephritis and Life Insurance

I fear it may be asked what practical bearing all this complex matter may have on life insurance examination. My reply is that although each of these groups represents a condition dangerous to the patient's life, the degree of danger varies considerably, and that the growth in popularity of short-term policies makes it expedient for us to be able to recognise those cases which are acceptable at increased premiums.

The first thing which I would stress from the point of view of life insurance examination is the extreme importance of accurate blood-pressure estimations in all cases falling into the category of nephritis. I think that it is a very serious mistake to reserve blood-pressure estimation for applicants in the last decades of life. Essential hypertension may appear at an age as early as 20. Minor degrees of renal damage in pregnancy may easily escape observation and may set up hypertension with fatal effects a few years later; I think that no woman who has borne children should be accepted for life insurance without very careful consideration of her history and of her blood pressure. The personal factor of the examining medical man is of course the great difficulty in this respect; the present generation of medical students is undoubtedly much better instructed as regards hypertension than were its predecessors, but it would be idle to pretend that the estimation of diastolic pressure, or even interpretation of it, is to-day a matter for any but the expert.

The next point I would emphasise is that careful examination of the urine remains of major importance, and that if no albumin is present on ordinary clinical examination it is practically impossible for renal failure even in its earliest stages to be present, and there is no indication that it is likely to occur at a later date. In other words, observation of the specific gravity of a urine which contains no trace either of sugar or of albumin is, for practical purposes, superfluous.

The determination of the prognosis in any single case belonging to any one of the groups I have mentioned must be a matter for expert consideration. Perhaps it is well to mention those signs which should lead to immediate and final rejection; of these I would say that definite changes in the blood chemistry and the presence of exudates or hæmorrhages in the retinæ are the most certain. At the other end of the scale I would say that qualified acceptance can usually be given with safety to cases of nephritis which, five years after onset, exhibit albuminuria as the sole evidence of disease, and that mild degrees of hypertension, without albuminuria, without cardiac involvement, and with a systolic pressure below 180 and a diastolic pressure below 100, tend to be far too heavily loaded at the present time.

It may seem that I have delivered a lecture of great complexity in order to conclude with a handful of platitudes. I can only plead that I have attempted to bring before you a conception of nephritis which holds out genuine promise for the future.

THE ANATOMY OF ASTHMA
AS DISCLOSED BY LIPIODOL INVESTIGATION

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(WITH ILLUSTRATIVE PLATE)

ALTHOUGH recent investigations into the biochemical, bacterial, and nervous relationships of asthma have rendered our knowledge of the disease less obscure, hitherto its pathological anatomy has remained entirely a matter for conjecture. The introduction of the use of lipiodol, however, promises to throw light on the subject by the opportunity it affords of studying anatomically the condition of the bronchial tree and its ramifications in the asthmatic patient, both during his paroxysms and in the intervals between attacks. Moreover, lipiodol by its therapeutic action may give a degree of relief even in intractable cases, which is well worth the apprehensive discomfort felt by the asthmatic patient when faced with the prospect of even a small operation.

Ordinary X ray examination of the chest has disclosed that in 300 consecutive cases of asthma 39 per cent. appeared normal and 61 per cent. presented complications [1] incidental to but not necessarily an essential part of asthma. In place of conjectural induction based on shadows of varying density, investigation of the bronchial tree in asthma by means of radio-opaque lipiodol affords sounder basis for differentiating the normal from the pathological, and will possibly hasten an advance hitherto denied owing to the lack of exact anatomical information which autopsy has failed to produce.

THE RESPIRATORY MECHANISM

Elsewhere I have dealt with asthma associated with chronic bronchitis, bronchiectasis, and the permanent

[1] Bray, G. W.: Asthma, Hay Fever, Eczema, Migraine. London, 1932.

irregularities of the bronchi revealed by lipiodol. The present paper is restricted to a study of the clinical complex known as the Trousseau type of asthma. Ætiologically this condition may be regarded as attributable less to morbid change than to physiological defect as the main factor: the result of what may be termed a delirium of the respiratory nervous control, brought about by incoördination of the respiratory autonomic mechanism, in which the vagus impulses dominate and sympathetic action is in abeyance. Whatever the immediate conjectural cause of that disturbance, whether chemical, mechanical, or psychological, the paroxysm produced would seem to be dependent on an inherited predisposition of the respiratory centre to respond to the stimulus of some biochemical agent, possibly a product of metabolism, or nutritional defect, as a sequel to the deprivation of necessary endocrine secretion or lack of simple salts.

In the production of asthma there is, I would suggest, a definite and inseparable relation between the modes of action of the vagus nerve and of the sympathetic; and further, that whilst asthma is the clinical evidence of dominant vagus action, chronic bronchitis is the outward expression of sympathetic predominance. The close relationship between the two clinical conditions must be recognised as calling for their joint investigation before any real progress can be made in their cure. In the autonomic nervous system controlling the bronchial tree the functions of the vagus and sympathetic are antagonistic, the former constricting, the latter dilating the bronchi. Overaction of the vagus, productive of the clinical picture known as spasmodic asthma, suggests the possibility of the opposite phenomenon, dependent on dominant sympathetic impulses.

In normal respiration the dual nervous control maintains an even balance, the sympathetic exerting its influence in inspiration by causing some dilatation of the air-passages, the vagus in expiration by constricting them. In health there is physiological harmony and coördination between the two controlling factors. Disturbance of the balance allows prevailing vagus impulses to bring about spasmodic asthma; between the paroxysms sympathetic reaction, as a complementary part of the process of respiration, shows itself by the wheezing, associated with the complete freedom from respiratory obstruction, which brings relief to the victim. The dilatation of the bronchioles in asthma is the result of the predominant sympathetic action, which may involve the whole or part of the lung, or only a single branch of a bronchus. It is the distribution of this sympathetic control of the air-passages in clinical asthma which the use of lipiodol has been so successful in demonstrating.

TECHNIQUE OF LIPIODOL INJECTION

In my opinion examination by lipiodol is correct procedure for all asthmatic persons over the age of 10 years, whilst it may be administered with satisfactory results to younger subjects, as in one of my cases, a child 5 years old. Lipiodol, being chemically and physiologically almost inert, is not a bronchial irritant and seldom precipitates a paroxysm. But to anticipate any exacerbation during the process of injection, and to control the bronchial reflex, 10 minims of adrenaline 1 : 1000 are given to the asthma patient hypodermically immediately before the lipiodol is injected.

The small operation of injecting lipiodol is a procedure which requires a little practice. I personally inject via the cricothyroid membrane, using novocain ½ per cent. intradermally as a local anæsthetic; 7½ minims of cocaine 5 per cent. are next introduced into the (adult) larynx to abolish the cough reflex. The injection is given very slowly with a curved trocar and cannula of my own pattern. The lipiodol makes its way by gravity along the bronchial tree; if too much is given it may occupy the whole lumen of the tube and cause collapse of the lung, whole or in part, or imperfect distribution is likely to ensue. Lipiodol makes its way not only by gravity but by diffusion, spreading equally over the whole inner surface of the tube. The maximum for an adult is about 20 c.cm. More than this is apt to get into the alveoli, especially if the patient coughs and overcomes the sphincter action where the bronchiole becomes alveolus, or if there is frank emphysema. If the alveoli are injected then the bronchi will be obscured; one cannot see the branches of the tree for the leaves. For a child 3–5 c.cm. is enough. The few accidents which occur in lipiodol injections are due to failure in technique.

Provided there is no spasm of the bronchial muscles the radio-opaque lipiodol penetrates with remarkable freedom into the minutest ramifications of the bronchial tree and, unless there is emphysema or the patient coughs, it will stop short of the alveoli. If there is spasm of the bronchial muscles, or if there is spasm in a particular area of lung, it will not penetrate. Most of the lipiodol is coughed up; some may be coughed up and swallowed, when it will pass the stomach unaffected by gastric juice but, coming in contact with the lipase of the pancreatic juice, the lipiodol (which is a very stable oleate in an oily solution) is broken up and some, seldom serious, iodine intoxication may ensue.

DR. CHRISTOPHERSON: ANATOMY OF ASTHMA

Legends to Illustrations on Special Plate

FIG. I.—Spasmodic asthma; attack during injection. The lipiodol has not penetrated far into the bronchi owing to exacerbation of asthma during injection. Compare this film with Fig. II., where lipiodol has entered the bronchioles, the asthma being quiescent.

FIG. II.—Woman aged 32. Typical spasmodic asthma showing irregularity in outline of bronchi (beading). Network of small dilated bronchioles.

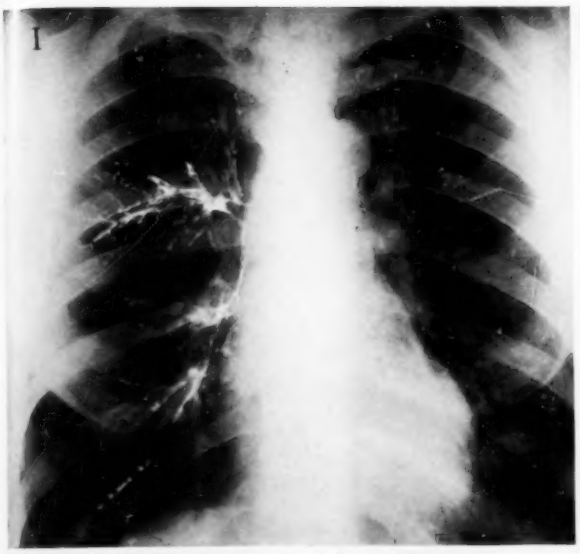
FIG. III.—Spasmodic asthma with some emphysema in upper and middle lobes of right lung.

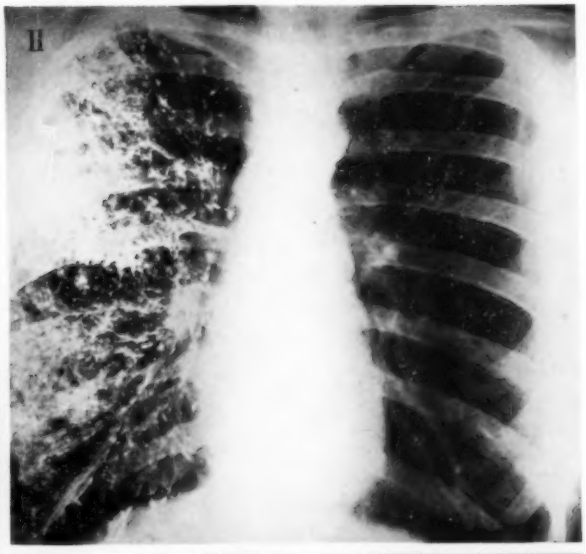
FIG. IV.—Spasmodic asthma. Right side of the thorax. Some of the larger bronchi are dilated and varicose, retaining a good deal of the lipiodol, but the characteristic network of dilated small bronchioles is shown in the peripheral zones of the lung.

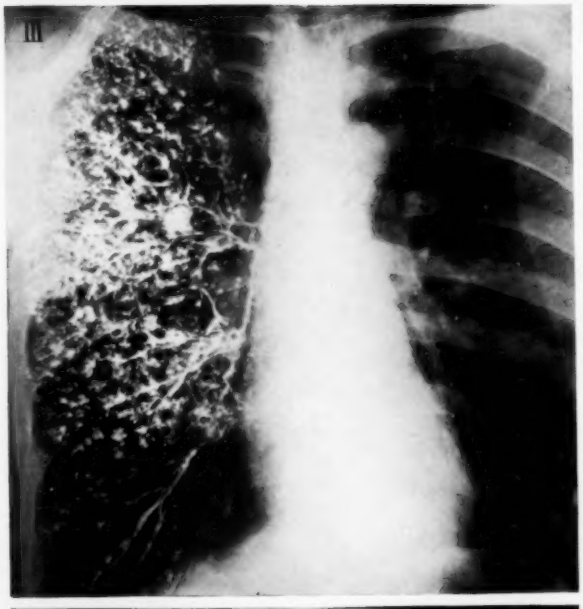
FIG. V.—Aggravated case of spasmodic asthma of many years' standing. On the right side the appearance is characteristic of lipiodol given a week previously; the remaining lipiodol is situated within the alveoli giving a punctate "scarlatiniform rash" pattern. Note on the left side, with lipiodol recently introduced, the network of dilated smaller bronchioles. In some places in the upper part of the lower lobe the lipiodol has entered the alveoli (showing emphysema). In the lower part of the left lower lung the bronchi appear like snapped-off sticks (better shown in the lateral view), probably due to local constriction of bronchi.

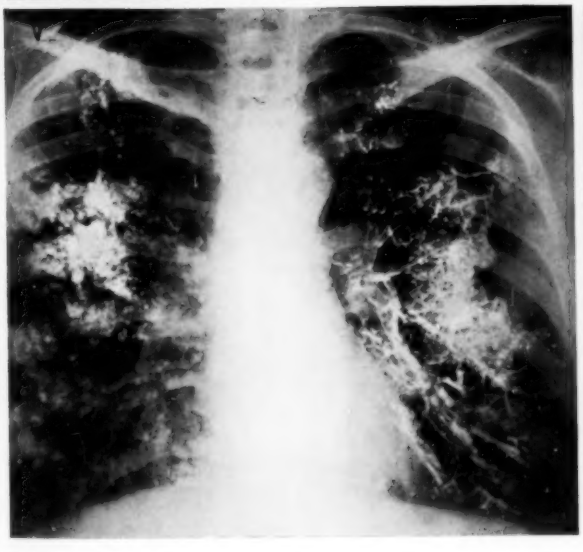
FIG. VI.—Lateral view of the right side of the thorax in case of aggravated form of asthma. Some of the larger bronchial tubes are varicose, but in the lower lobe they appear as if snapped off short (contraction due to local area of asthma spasm). The bronchioles in the middle lobe are dilated and some lipiodol has entered the alveoli (showing emphysema). Note the network of dilated small bronchioles in upper lobe, which is a characteristic appearance in asthma films.

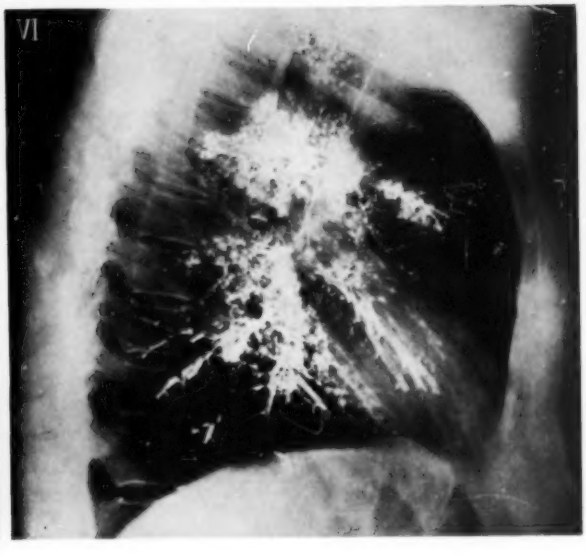
DR. CHRISTOPHERSON: ANATOMY OF ASTHMA





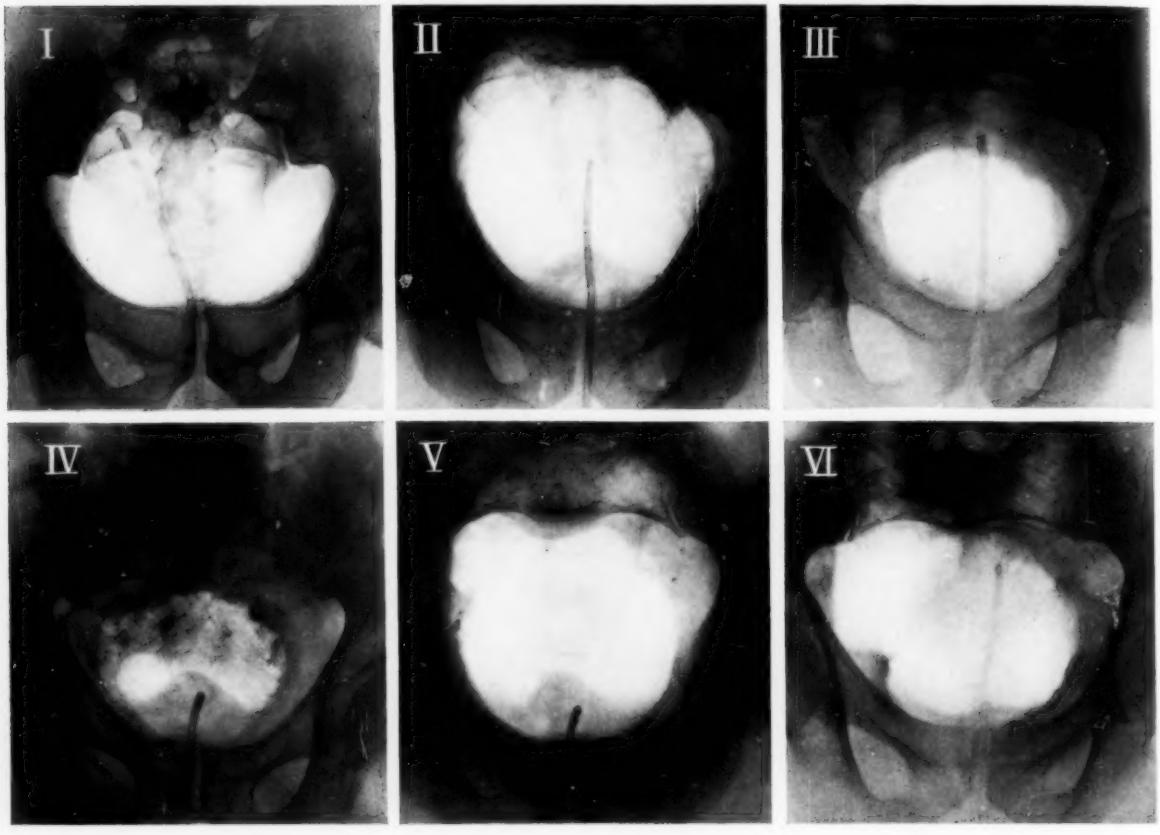






DR. ROSS: RADIOGRAPHIC DIAGNOSIS OF PROSTATIC ENLARGEMENT

(Radiograms by Dr. J. F. Bromley)



DR. BRAILSFORD: SLIPPING OF EPIPHYSIS OF HEAD OF FEMUR

X RAY APPEARANCES

When examination by X rays is made directly after the introduction of lipiodol one of three pictures may be presented.

(1) The clinical condition of asthma is a general one, affecting the whole lung, with the bronchioles usually in a state of dilatation and therefore free to the passage of lipiodol into the entire bronchial tree. This, the most common condition, presents the characteristic mesh-like appearance of dilated bronchioles, together with irregular network of smaller tubules, whilst the larger bronchi show an apparently normal calibre. The potential sphincter at the junction of the terminal tubules with the alveoli generally, for the time being, prevents the further passage of lipiodol unless the patient happens to cough, thus relaxing the sphincter and allowing the succeeding inspiration to force fluid into the alveoli. In cases of emphysematous distension of the lung tissue, which entails loss of the sphincter control, similar entry of the fluid into the alveoli may occur. Even in the absence of cough or emphysema examination on the day following injection will show that the lipiodol has invaded the alveoli, yielding a typical punctate stippling or mottled cluster of grapes appearance (particularly in those portions of the lung which happen to be emphysematous), and presenting a marked contrast with the clearly outlined irregular network of the finer bronchial tubules due to sympathetic domination.

(2) According to the state of the bronchial tree the picture may show, in certain cases, a local or patchy distribution of the affected parts of the lung; constriction of the bronchioles in one area having prevented entry of the lipiodol and elsewhere, under sympathetic action, the dilated bronchioles having allowed the fluid to pass.

(3) Less commonly there may be shown little, if any, penetration of lipiodol into the tubes in consequence of sudden vagal constriction of the bronchi or bronchioles, as in the rare event of a paroxysm occurring during the operation.

These pictures are illustrated in one or other of the six radiograms I have selected, the legends of which speak for themselves.

CONCLUSIONS

In explanation of the more usual result of lipiodol injection, with its free entry into the whole bronchial tree, it may be suggested that, in ordinary cases of asthma, this quiescent stage marks the phase of sympathetic action responsible for the relaxation of the bronchial musculature and so the opening of the bronchioles. In the spasmodic stage the converse is brought about during the phase of vagal impulses leading to constriction and obstruction of the respiratory passages. The two phases of antagonistic nerve impulses governing the phenomenon of asthma, however, do not necessarily involve the whole lung, but may be confined in their action to a part of a lobe, to a single bronchus, or to an isolated area. Further it would appear that, in those who have suffered from asthma for some length of time, certain complications, made manifest by the use of lipiodol, have led to permanent dilatation of the alveoli—i.e., emphysema dependent on the mechanical effect of bronchial obstruction, the constricted lumen imposing a barrier to the forcibly expired air during a paroxysmal attack.

In some cases there is seen to have resulted a permanent dilatation of the bronchial tubes with beading and varicosity, possibly the effect of constant over-action of the sympathetic causing the relaxed tubules to become still further dilated by the explosive force of the asthmatic cough. On the other hand, the lack of evident change in the calibre of the larger bronchial tubes, in asthma as well as in chronic bronchitis, may be due to the cartilaginous support and the comparatively small amount of dilatable muscle in the bronchial walls.

SUMMARY

(1) Lipiodol affords a valuable means of studying by X ray examination the anatomical distribution of the bronchial tubes and their ramifications.

(2) Lipiodol will demonstrate the permeability of the bronchioles and smaller branches in asthma and bronchitis, whether in a state of constriction or dilatation, and the extent of free entry into the alveoli.

(3) The antagonism of the dual nervous control of the bronchial tree is demonstrable as playing an important part in asthma and chronic bronchitis—the vagus in causing constriction and the sympathetic dilatation of the bronchioles.

(4) Lipiodol is also of value from its therapeutic action in cases of the clinical complex known as asthma.

DR. ROSS: RADIOGRAPHIC DIAGNOSIS OF PROSTATIC ENLARGEMENT

Legends to Illustrations on Special Plate

FIG. I.—Normal aerocystogram. A rather large bladder.

FIG. II.—Large intravesical projection of prostate with a distended bladder.

FIG. III.—Same as Fig. II. after prostatectomy. Note the bed of the prostate, and the tags of tissue which have been left behind, and compare the capacity of the bladder in its present state with that before operation.

FIG. IV.—The prostate is enlarged and occupies almost half the bladder; the bladder wall is thickened and trabeculated but the bladder is not yet dilated (bladder in systole).

FIG. V.—Another example of enlargement of the prostate.

FIG. VI.—Same as Fig. V. after prostatectomy. The area to the right is a collection of gas in the colon.

DR. BRAILSFORD: SLIPPING OF EPIPHYSIS OF HEAD OF FEMUR

FIG. I. (Case 1).—Radiogram of the pelvis and hip-joints of a boy aged 16, showing on the left side marked slipping of the epiphysis of the head of the femur. Note the well-defined metaphyseal periphery of the epiphysis and the woolly outline of the extremity of the neck of the femur. On the right side there is thickening of the metaphysis; the epiphyseal border is well defined, whereas the diaphyseal border is woolly. Broadening of the sacro-iliac joints indicates similar disturbances of ossification.

FIG. II.—Radiogram of the knee-joints of the same patient as Fig. I. (taken on the same day), showing site of osteotomy of the right femur. Note the irregular extremity of the diaphysis of the fibula on the right side and the broadening of the metaphysis, with a regular epiphyseal border, indicating that growth is chiefly taking place from the diaphysis. The metaphyses of the other bones do not show any definite changes.

FIG. III. (Case 3).—Radiogram of the pelvis and hip-joints of a youth aged 21. There is general rarefaction and softening of all the bones as indicated by the woolliness of outline, the bending of the necks of the femurs, and the crushed triradiate pelvis. The metaphyseal borders of the epiphysis of the femur heads are still relatively well defined, but the outline of the extremities of the ends of the diaphysis is indefinite.

RADIOGRAPHIC DIAGNOSIS OF PROSTATIC ENLARGEMENT

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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

THE prostate gland, lying as it does at the neck of the bladder, is in an unrivalled position, when diseased, to disturb the function of the bladder. In senile enlargement (to use a term which does not commit one as to the pathological process underlying the condition) we have a remarkable example of how the middle and lateral lobes have no other outlet for their expansion but to transgress upwards inside the sphincter vesicæ to the vesical outlet. Behind it is prevented from too great an expansion by the strong fascia of Denonvilliers, and below by the superior layer of the urogenital diaphragm. Apart from symptoms due to distortion and compression of the common ejaculatory ducts—e.g., aspermia or sexual neuroses—the urinary trouble will occur only when the intravesical enlargement has succeeded in elevating the apex of the trigone sufficiently to reduce the size of the bladder outlet by its ball-valve action. It is then that the patient complains of symptoms, and as the "hump" increases in size, so the symptoms increase in severity and frequency.

At this stage the practitioner relies solely on a rectal examination for confirmation of his diagnosis, whilst the urologist will employ his cystoscopic dexterity. If we disregard carcinoma of the prostate which is confined at first to the posterior lobe and initially produces more general and referred symptoms than local disturbance, and is not visible by cystoscopy until it has infiltrated and ulcerated through the mucous membrane of the bladder, cystoscopy has many disadvantages: (1) owing to contracture of the neck of the bladder it may be impossible to pass the cystoscope; (2) hæmorrhage from the passage of the instrument may cloud the field and prevent distinct vision; (3) gross sepsis may also cloud the field; (4) severe pain may necessitate an anæsthetic (general or spinal); and (5) an expert cystoscopist may not always be at hand.

Apart from these considerations, we are all familiar with the case of the man who has an unmistakably enlarged prostate when examined per rectum, but, on opening the bladder, is found to have either no intravesical enlargement or very little enlargement, but nevertheless has a contracture at the neck of the bladder which is responsible for his symptoms. This is the so-called "prostatic bar obstruction," "contracture of the neck of the bladder," or "prostatisme sans prostate." On the other hand, there is the patient who, from the history, has a typical enlargement of the prostate, yet on rectal examination shows little palpable enlargement; if we are successful in passing the cystoscope, we may find an enlarged middle and perhaps also lateral lobe elevating the anterior half of the trigone from the prostatic urethra backwards.

If any of the contra-indications to cystoscopy are present, absolute diagnosis between the two conditions—senile enlargement and prostatic bar obstruction—is a matter of uncertainty and guesswork, and as the latter condition does not necessitate an operation as serious as prostatectomy, the distinction is of some importance.

AEROCYSTOGRAPHY

The purpose of this paper is to emphasise the value of diagnosis of prostatic enlargement by aerocystography—i.e., radiography of the bladder after it has been filled with air. At the outset let it be understood that this is by no means an original method of diagnosis. Koller, in 1904, described a case of diverticulum of the bladder diagnosed by pneumoroentgenology, and the American radiologists have employed this method in the diagnosis of prostatic enlargement and in the visualisation of pelvic conditions causing pressure on the bladder. The technique is extremely simple, but differs somewhat from that of the authorities read. I regard this method as one of the essential links in the chain of investigations to be carried out in any case of suspected enlargement of the prostate. It is a rational proceeding, and one would expect it to be recommended and used generally although, in this country at any rate, this is not the case. The probable reason why it is not in general use is that cystoscopy has developed to such a degree that no other method is necessary unless cystoscopy fails. Where cystoscopy is unsuccessful, its value is obvious. Where cystoscopy is possible, aerocystography is still a valuable asset, and in my opinion gives a far more definite and helpful picture. It seems to me a superior method, because where a prostate is large its size cannot be gauged satisfactorily by cystoscopy, owing to the proximity of the lens to the gland. In a short series of 30 cases in which I have used the method the results are such that I have come to place absolute confidence in it. At the present time we would not consider cystotomy unless an aerocystogram had been taken previously.

Apart from enlargement of the prostate, aerocystography may be used in other conditions: (1) vesical calculi; (2) neoplasms; (3) foreign bodies; (4) compression from without—e.g., tumour of the uterus, ovary, or sigmoid; and (5) vesical diverticula. But as these conditions can be diagnosed more satisfactorily by other and simpler methods, such as cystoscopy in tumours of the bladder, I shall here only consider its practical application to enlargement of the prostate.

TECHNIQUE

The method can only be employed when the bladder is completely empty, and even small quantities of urine may obscure the picture. When the patient is admitted to hospital or nursing-home, if he has acute retention it will be necessary to tie a catheter in his urethra, this being done, of course, with the utmost sterile precautions. If there are 15 oz., or less, of residual urine, the whole may be decompressed at once, but if not, it will not be safe to remove more than 15 oz. at the time, the rest being withdrawn at the rate of 5 oz. every hour. It may take three or four days to completely empty the bladder, depending, naturally, on its capacity. Should there not be acute retention, the investigation can be carried out at any time.

When the bladder has been emptied as completely as possible and if the condition of the patient is good, the large rubber catheter is removed and a smaller one is substituted. It is essential that before taking the X ray picture the colon should have been well cleared out. The catheter I use is a No. 5 French. This should be new, or boiled at the most twice, since boiling destroys the rigidity of the rubber—a very necessary factor with small catheters required to pass through a contracture at the vesical outlet. It is better to use a small catheter than a large one with a small connexion, for the large diameter may

obscure a small intravesical enlargement of the prostate. Once the catheter is passed, it is better to postpone injection of the air until the patient is on the Potter-Bucky diaphragm. To the distal end of the catheter is attached a 20 or 50 c.cm. record syringe (it will be found that this fits quite air-tight), the piston being withdrawn to its utmost. The patient is asked to relax the muscles and to refrain from straining as far as possible, and to give warning as soon as he feels that his bladder is full, or when he feels as if he wished to pass urine. The piston is gently charged home. The patient will say that he felt a "whiff of something" going into his bladder. The catheter is clipped with a Spencer Wells artery forceps by an assistant, the syringe is then detached from the end of the catheter, and the piston is again withdrawn to its utmost. With the piston at its utmost, the syringe is once more attached to the end of the catheter, the Spencer Wells is released and the piston charged home again. This process is repeated, the amount of air injected being easily estimated from the number of fillings required. Depending on the capacity of the bladder, a time will arrive when the patient will say his bladder is filled. If this is large, it will be seen distended above the pubes. If not, the patient's own sensations are not very reliable, especially in a nervous patient, and as it is necessary for a good film that no part of the bladder wall should be collapsed, it is better to rely on the actual pressure of the air inside the bladder. As soon as the bladder becomes over-distended there will be a positive pressure of its contents, which is readily gauged by releasing the Spencer Wells without removing the syringe; when, if a positive pressure really exists, the charger will come back on you. This is a most reliable sign, and it is then quite safe to occlude the catheter and take the radiogram.

The essential point in the radiography is that the kilo-voltage of the tube should be kept low, as is usual when dealing with a good background of air giving excellent contrast (40–50 K.V. should be quite sufficient). The obliquity of the tube is the same as for ordinary radiography of the bladder. Pfahler also takes a posterior film with the central ray directed obliquely upward and forward, so as to project the sacrum and coccyx above the field. I have found this unnecessary, since just as much information can be obtained from the anterior film. The posterior film is merely confirmatory.

It may seem a laborious process to remove and reinsert the syringe perhaps 20 or 30 times. American radiologists use a Higginson's syringe, which is certainly easier, but which lacks the ability to estimate the exact moment at which a positive pressure is set up within the bladder, and further, the exact capacity of the bladder cannot be easily estimated in this way. I have also used a pressometer, which would appear to be very exact, but in point of fact is not, because the surface tension of the mercury in the vertical tube is sufficient to overcome the first few millimetres of mercury rise, which are so important. Further, the capacity of the bladder cannot be estimated at all.

There is no danger of rupture of the bladder if the precautions stated are observed. The patient undoubtedly feels much discomfort, but as the bladder has only to be distended for a few moments whilst the film is being taken this is not a great inconvenience. Some difficulty is often experienced with a malignant prostate where the vesical sphincter is infiltrated with new growth, and where sphincter control is lacking, air being often forced out of the urethra outside the catheter, but even in these cases the taking of the film is so quick that enough air remains in the bladder to give good visualisation of its interior.

INTERPRETATION

Interpretation is easy. In an ordinary X ray film of the pelvis, very little, apart from the bony framework, can be seen in the normal case. It is possible to see vesical calculi, unless they are pure uric acid stones; also phleboliths. Tumours cannot be seen in the ordinary way (unless calcified—e.g., calcified uterine fibroid pressing on the bladder), and the explanation is simple. There is not enough contrast. I do not wish to make too much of this, however, for papillomata and carcinomata are best observed by cystoscopy. It is in enlargement of the prostate that aerocystography is of most value.

A normal bladder shows an outline of air, which is usually circular, and with absolutely smooth walls. Its capacity, as estimated by the number of fillings required, should be about 300 c.cm. When the film is taken at the correct angle the lower margin of the bladder should be seen about a quarter of an inch above the margin of the pubic bones (Fig. I.), quite distinct, running laterally within the ileo-pectineal lines to the iliac bones. The extent to which it rises above the promontoric line depends, of course, on its distensibility. With an acute retention of short history it usually remains within the pelvis, but with a long history its capacity may have increased to 600–900 c.cm., and it may rise as high as the upper margin of the ala of the sacrum and the fifth lumbar spine. This may not seem very high, but if it is remembered that the film is taken obliquely at an angle of about 15°–25°, it will be realised that the impression given is a false one, and that in reality the superior margin of the bladder is actually at a higher level than this. A large bladder is usually ovoid in shape owing to lateral compression in the pelvis, and may be displaced somewhat to the right by a loaded pelvic colon. Gas in the sigmoid often renders the picture indistinct, and it is therefore important to clear the bowel before the radiogram is taken. Often the contrast is so good when air is present in the rectum that it is possible to visualise the valves of Houston. With an intravesical enlargement of the prostate (middle and lateral lobes), the first thing that is noticed is the projection that it makes at the base of the bladder. It is quite definite, conical in shape and unmistakable. Its edges are continuous with those of the inferior vesical margin. There is no other shadow like it, and it is not very much less dense than the shadow thrown by the catheter itself (Figs. II. and V.). I have seen the fibres of the levator ani throw oblique, centrally converging linear shadows, but these again are unmistakable, and do not show when the prostate is much enlarged. In the female a similar shadow may be thrown by a cervical fibroid compressing the bladder.

Calculi are readily seen within the prostatic substance. If the swelling is seen to be smooth and regular in outline one would think of a benign enlargement of the prostate. If the upper surface is irregular in outline or the enlargement limited, especially to one lobe, one would think of a malignant condition, particularly so if there is infiltration beyond the normal boundaries.

Prostatic bar of obstruction of the glandular type (usually due to hypertrophy of the subcervical gland of Albarran) should be suspected if the symptoms are those of hypertrophied prostate, but no definite conical shadow is seen on the radiogram. There may be an indefinite blurring around the sphincter,

but never the conical, sharp-edged shadow which is typical of the prostate. With a large fibrous bar of the trigone a well-marked shadow may be cast at the base, with a perfectly straight, horizontal, upper margin, running from side to side, and lying at a distance of ¼ in. to ½ in. above the lower margin, according to the depth of the bar.

The state of the bladder wall should be observed in all these cases. With a chronic retention of fairly long history as mentioned above, the upper border of the bladder will be seen above the ala of the sacrum, and the margin will be smooth and the wall thin. In a subacute obstruction, where the pathological process has been limited to muscular hypertrophy, the wall will be seen to be markedly thickened, and definite fasciculations can be seen (Fig. IV.). Should there be a diverticulum of the bladder, the margin is well shown, and also the cavity and neck. The presence of this can be confirmed by sodium iodide or lipiodol cystogram or by cystoscopy, if possible.

It is of interest to note the state of the bladder after prostatectomy. In these cases the shadow originally thrown by the prostate is no longer visible, and, furthermore, the actual bed of the prostate can be seen outside that area if the operation has been successful and there has been no recontraction of the vesical sphincter. The bladder is small. Its capacity may be half, or even less, of the original, showing that the obstruction has been relieved. Any tags of prostatic tissue or mucous membrane left behind, if big enough, can be seen quite clearly (Figs. III. and VI.).

It can confidently be stated that if the essentials above are observed, the exact state of the interior of the bladder is visualised. This has been confirmed time after time at operation. These essentials are: the use of a narrow rubber catheter sufficiently rigid to pass the contracture at the neck of the bladder; complete emptying of the bladder; introduction of sufficient air to just set up a positive pressure; correct angle of the X ray tube; and good preliminary clear-out of the bowel.

CONCLUSIONS

(1) Aerocystography is a valuable adjunct to all other methods of diagnosis of prostatic enlargement. (2) In addition, it tells us the state of the bladder. Diverticula and calculi are thrown into better contrast. (3) Where cystoscopy is impossible, it is the only method of visualising the intravesical enlargement. (4) The technique is simple, it is unassociated with any dangers beyond the ordinary ones of catherisation, and it gives valuable information. No anæsthetic is required.

I am indebted to Mr. T. H. Richmond and Mr. F. W. Duthie for permission to publish this work, which has been carried out in its entirety on cases under their care in the North Staffordshire Royal Infirmary, also for their kind advice and assistance; and to Dr. J. F. Bromley for his valued coöperation.

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SLIPPING OF THE EPIPHYSIS OF THE HEAD OF THE FEMUR

ITS RELATION TO RENAL RICKETS

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(WITH ILLUSTRATIONS ON SPECIAL PLATE)

THE purpose of this paper is to show that renal rickets is the cause of a good proportion of the cases of slipping of the epiphysis of the femur, and arguments are deduced from the radiographic evidence against the more popular theory that trauma is the chief factor in its production. The importance of these findings is that operative measures designed to correct the deformity, heedless of the renal disease, may result in failure and may jeopardise the life of the patient.

Displacement of the epiphysis of the head of the femur usually results in the deformity known as adolescent or epiphyseal coxa vara. This condition is not uncommon—indeed, in young people between the ages of 12 and 21 years it has a frequency equal to that of tubercle of the hip-joint commencing at this period, and as the clinical signs of the two conditions are often indistinguishable, though the treatment and prognosis are so different, correct diagnosis is essential. In pre-radiographic days the lesion was discovered on a number of occasions only during or after resection of hip-joints which had been diagnosed as tuberculous. In a previous paper I have pointed out that by means of radiography it is now possible to differentiate between the various diseases and abnormalities of the hip-joint. In the series there described 26 cases of slipped epiphysis of the femoral head were observed—18 in males and 8 in females. Of the 18 males the slipping was on the left side in 13, in the right hip in 4, and in the other the epiphysis of both femurs had slipped. In one case, though definite slipping had only taken place on one side, the metaphysis of the opposite side was widened and its borders irregular, suggesting a pre-slipping stage. Of the females it was on the right side in 5 and on the left in 3. The condition therefore appears to be commoner in the male on the left side.

Radiographic Appearances

The radiographic appearances of the slipped epiphysis of the head of the femur are characteristic (Fig. I. on Plate). The epiphysis has a very clearly defined and regular metaphyseal periphery as if outlined by a pencil, its convex articular border being regular except for the fovea. It is in the form of a cap which appears to have slipped off the upper convex extremity of the neck of the femur, the margins of which are higher than the corresponding margins of the epiphysis, the deformity depending upon the degree of slipping. The pressure of the upper end of the neck against the "freed" crescentic epiphysis, which is applied to the articular surface of the acetabulum, tends to increase the displacement by causing the epiphysis to slip in the acetabulum downwards and backwards with some inward rotation. In cases with extreme displacement the upper end of the diaphysis comes into apposition with the superior border of the acetabulum, and the metaphyseal surface of the epiphysis is forced against the inferior surface of the neck of the femur. There is no irregularity of the bone trabeculæ or surfaces to suggest

bone disease or injury. The joint space and the acetabulum appear to be unaltered. The convex upper margin of the diaphysis is usually not so clearly defined, and its outline appears to be woolly.

Though coxa vara is the usual deformity produced, Scheuermann has described and illustrated with radiograms a slipped epiphysis in which a coxa valga deformity resulted. Owing to the fact that patients who develop this deformity often complain of pain or discomfort in the region of the hip-joint for some weeks or even months before the actual slipping occurs, a radiographic examination is sometimes made and will often show the pre-slipping condition. This is important, for it will suggest treatment designed to prevent the slipping, and any investigation and treatment which will do this should be rigorously pursued because radiograms show that, once the epiphysis has slipped, the best result possible will be complete reduction with premature fusion and stunted development resulting in some degree of shortening. (Mr. S. T. Irwin has described the best result I have seen: only ¼ inch of shortening without any arthritic changes.) On the other hand, in spite of complete reduction, the epiphysis may undergo degenerative changes and result in a very disabling deformity for the patient. Incomplete reduction results in a joint prone to very early chronic arthritic changes with consequent disablement.

The radiographic features of this pre-slipping stage should therefore be sought in children suffering from discomfort or pain in the hip-joint. The clinical features may suggest early tuberculosis, but the radiogram shows bone of normal density and a regular outline of the borders of the epiphysis and diaphysis, with no evidence of any erosion or destruction of the bone lamellæ, which on repeated examination will rule out tuberculosis. All that is shown is some increase in the density of the metaphyseal periphery of the epiphysis—the "pencil lining" already described—some increase in the thickness of the metaphysis in part or throughout its whole breadth, with some woolliness of the outline of the extremity of the diaphysis (Fig. I., right side). I have one case of slipped epiphysis in which the radiograms show fragmentation with splaying out of the roof of the acetabulum (resembling Perthes's disease of the femoral epiphysis), which later radiograms show to have consolidated. This is a rare finding in these cases.

Ætiology

Numerous investigations of the cause of this condition have been made. The opinions of the investigators can be grouped under three headings: (1) disease, (2) weight-bearing and strain, (3) trauma. Personally I hold that each of these factors comes into operation to some degree; there is some disorganisation of the metaphysis which lessens its capacity to withstand the normal shearing stresses and strains, and the condition may be brought sooner into prominence by some trauma which would not have affected the normal femur.

DISEASE

Acute pyogenic infection of the hip-joint very commonly destroys the metaphyseal tissue and results in the separation of the epiphysis as a sequestrum. Lindemann has reported a case occurring in a child of 12 who was a congenital syphilitic, suggesting that the metaphysis was disorganised by the syphilitic process. Froelich, Platt, and others consider that the separation is brought about by a low grade of sepsis.

Localised osteochondritis and disturbances of endocrines, as instanced in the adiposo-genitalis type of dystrophy, have been put forward as the causative factor. Schwartz stated as his opinion that separation of the normal epiphysis was not possible, and that it was due to some unknown disease of the cartilage.

Many observers, notably Block, Fiorani, Frösch, Hofmeister, Haedke, Müller, and Peltesohn, have suggested rickets as the causative factor, though many others have strongly opposed this theory. Key, who has published the results of an extensive investigation of the published cases, as well as the findings in a number of cases which he has examined, states: "The only abnormality thus far detected is a slight broadening of the cartilage of the epiphyseal line. At this period some change occurs in the region of the epiphyseal line which causes a weakening of the structures which bind the head to the neck of the femur. The nature of this change is unknown, as no such case has ever been studied pathologically," and later: "It is further to be noted that in frankly rachitic children I have never seen a case of separation of any epiphysis, nor have I been able to find a single such case in the literature."

Do not the following facts concerning renal rickets supply this deficiency?

RENAL RICKETS

The histories of the following cases of renal rickets, together with the radiograms, undoubtedly place this as a very definite cause of this lesion.

In the paper already mentioned I said that "slipped epiphysis appears to be due to some disintegration of the metaphysis rather than direct trauma, as most of the patients with this condition give no history of trauma and the radiographic appearances do not support the trauma theory." Since this was written a patient, a boy aged 16, was sent to me for X ray examination of the hip-joints (Case 1). The radiogram of the hip-joints (Fig. I. on Plate) showed that the epiphysis of the one side had slipped and the metaphysis on the other was thickened—the pre-slipping stage. I obtained the history that one year previously the patient had had an osteotomy of the lower end of the femur for the correction of knock-knee, so I made radiograms of both knees to see if they would throw any light on the pathology. These showed (Fig. II. on Plate) a definite thickening of the metaphyseal area of the upper end of the left fibula but no such change in the metaphyses of the lower ends of the femurs or upper ends of the tibia or the right fibula. From these appearances I suggested the diagnosis of renal rickets, which was confirmed later by the characteristic appearances of renal rickets in the epiphysis of the radius and ulna. The urine was shown later to contain a large amount of albumin. No suggestion of renal disease had been previously suggested.

More recently another patient (Case 2) was sent for radiography of the knee-joints. These radiograms showed that the lower epiphyses of both femurs had a slight degree of slipping, while the metaphyses of the upper ends showed the appearance which I have described as the pre-slipping condition. I again suggested that the condition was that of renal rickets and urine examination revealed much albumin. Radiograms of the upper and lower ends of the tibia, fibula, radius and ulna and upper ends of the humerus showed a similar thickening of the metaphyseal area. Yet radiograms of these same areas only one month after showed a most remarkable improvement; the metaphyses appeared to be almost normal. The radiograms of the long bones in these cases do not show the characteristic appearances seen in the radiograms of frank rickets. There is no suggestion

of bowing of the long bones or bending of the neck of the femur; except in the immediate neighbourhood of the metaphyses, the bones appear to be normal in density, and in the last radiograms of Case 2 little indication of the past, though recent, metaphyseal disturbance is to be detected. Parsons and Teall have described and illustrated a case of atrophic rickets with a four years' interval between the radiograms, showing complete disappearance of the signs of active rickets, though the bones appear in the healed condition to be rarefied, and they have pointed out that "the changes do not occur to the same degree in all the long bones—e.g., the radius and ulna of one arm may show changes much more marked than in those of the other side."

This observation is confirmed by Figs. I. and II., and proves that it is possible for renal rickets to cause a disintegration of the metaphyses of the upper end of one femur with resulting slipping without there being any further radiographic evidence of renal rickets.

In the type of renal rickets which Parsons and Teall describe as "woolly" the bones are generally softened and bend with pressure as in osteomalacia, which would appear to spare the epiphysis from separation. Fig. III. (on Plate) is a radiogram of the pelvis of a youth aged 21 (Case 3) with renal disease which has resulted in this "woolly" type of rickets. The pelvis has become triradiate. The epiphyses of the femoral heads show the sclerosed margin and the thickened metaphyses, but instead of the epiphysis slipping bilateral coxa vara deformity has resulted from marked bending of the necks of the femurs. Owing to the gravity of his renal disease he cannot stand, consequently the femoral metaphyses are not subjected to the strain of the erect position which the less disabled patient is allowed to endure.

The radiographic evidence of these cases of renal rickets proves therefore that this condition can induce slipping of the epiphysis of the head of the femur and even of other epiphyses. The rapid disappearance of the active rachitic changes at the metaphysis, as illustrated in Case 2, in which one month after marked changes were shown on the radiograms, the metaphysis was almost indistinguishable from the normal, would account for the objections of many observers who have stated that the bones showed no evidence of rickets. I have examined the urine of two further cases of slipped epiphyses which have united and found much albumin, though the bones do not show the changes I have described. Haswell Wilson reported that the metaphyseal tissue in a case of renal rickets, cited by Parsons, was indistinguishable from florid rickets, and microscopical examinations of the metaphyseal tissue of the hip-joints excised by Kocher, Frangenheim, and Haedke revealed alteration in the cartilage and the presence of osteoid tissue.

I am convinced, therefore, that renal rickets can be a definite cause of slipping of the epiphysis of the head of the femur. Lindemann has shown that this can also occur as a result of congenital syphilis in the radiograms of the joints of which we see somewhat similar changes in the metaphyseal regions. There are probably other excretory or secretory disturbances which produce this metaphyseal disorganisation which we should endeavour to determine.

STATIC CAUSES

It has been suggested that the condition can be induced by strain due to long-continued standing or by the superincumbent weight of the trunk, particularly in the obese patient, or by the increased strain thrown on one hip because of disease or deformity of the opposite hip. It has been suggested that this weight or strain led to the bending of softened rachitic bone of the neck of the femur which ultimately led to separation of the epiphysis. This is not supported by radiography. The femoral epiphyses which have slipped appear to be always associated with femoral necks which show no evidence of bending. I have a number of cases in which the radiograms show extreme coxa vara deformity owing to bending of the neck of the femur due to rickets, but only one of these show the slightest evidence of displacement of the epiphysis. This exceptional finding I believe to be due to an osteotomy which placed strain on a metaphysis in an active phase of rickets. The radiograms of the patient (Case 4), a girl of 6, showed a triradiate pelvis with marked bowing of the neck of the femur on both sides. A bilateral osteotomy of the upper third of the femur was performed. Radiograms taken six years after showed that the epiphysis of the left femur had slipped. In the radiograms of the long-standing case of renal rickets (Case 3), though the metaphyses show marked degenerative changes, no slipping is shown but marked bending of the neck of the femur. That the shearing strain on the metaphysis due to the superincumbent weight and muscle pull causes the displacement of the epiphysis I have little doubt, but it only happens after the metaphysis has been disorganised—it could never happen with a normal metaphysis.

TRAUMA

The first case of displaced epiphysis of the head of the femur was discovered by Brousseau in 1867 at the autopsy on a boy, aged 15, who had received his fatal injury when a vehicle passed over his hip-joint. But Rammstedt was unable to produce simple separation of the epiphysis experimentally.

Elmslie, Rammstedt, and others have suggested that trauma loosens the head epiphysis and that it gradually slips afterwards. Radiographically there is nothing to support the traumatic theory except that trauma insufficient to cause any displacement of the normal epiphysis may result in the displacement of an epiphysis with a disorganised metaphysis.

I have never seen a simple separation of the epiphysis of the head of the femur when a child has been brought for radiography because of a recent severe injury to the region of the hip, though I have seen a number of fractures in the neighbourhood of the metaphysis in such patients. On the other hand, one readily receives information as to past injuries if a child is brought complaining of pain or discomfort in the hip-joint, though there is no bruising or other clinical evidence of such an injury. If trauma is alone responsible, one would expect to see separation of the epiphysis after manipulative procedures to reduce congenital dislocations. Radiograms show that the trauma in such procedures is often sufficient to result in fragmentation of the epiphysis or even fracture of the neck or shaft of the femur, but I have never seen a simple separation of the epiphysis either immediately after, or with a long interval, which might be expected to happen if the epiphysis had only been loosened.

Radiograms also show that when an epiphysis has been displaced by trauma, portions of the metaphysis are also displaced with it—i.e., it is not a clean separation through the metaphysis as we see in slipped epiphysis. Bilateral slipped epiphysis is not a very uncommon finding. Hofmeister reports that

one-third of his cases were bilateral. While a patient is receiving treatment for one slipped epiphysis separation of the opposite femoral epiphysis may occur. I have only one example of a bilateral fracture of the neck of the femur in an adolescent—it is a very rare occurrence; in this case, as in all the other fractures of the neck of the femur, there is no suggestion of a simple separation through the metaphysis. Many of the patients with this displacement have complained of pain or discomfort in the affected hip-joint for weeks or months before the trauma occurred. This pain or discomfort has been often brought on by fatigue and relieved by rest, which in itself suggests the hip-joint was not normal, and, as previously stated, it is rare to find bruising or evidence of recent severe trauma when the radiogram shows a simple epiphyseal separation.

Conclusions

(1) Slipping of the epiphysis of the head of the femur in adolescents is due to disorganisation of the metaphyseal tissue which destroys its capacity to withstand the static strains or the trauma to which the normal joint is subjected without harm.

(2) Renal rickets is the cause of this disorganisation of the metaphysis in some cases, and should be excluded before any operative measures are adopted.

(3) The radiographic picture of renal rickets is almost diagnostic; the changes may only be seen in one joint.

(4) Consolidation and repair of the metaphyseal tissue in renal rickets may be seen by radiographic examination to take place in as short a time as one month.

(5) The urine of all patients showing slipped epiphysis should be examined on several occasions for albumin. The radiographic appearance of the bones in renal rickets is to some extent an index of the renal condition.

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FACIAL PALSY AND INFECTION WITH ZOSTER VIRUS

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IN 1907 Ramsay Hunt [1] wrote his classical paper on Herpetic Inflammations of the Geniculate Ganglion, in which he drew attention to the occurrence of herpetic eruptions in or near the external auditory meatus along with facial palsy, and sometimes with lesions of the eighth cranial nerve; and he brought evidence to show that the seventh nerve has a somewhat rudimentary sensory supply, overlapping that of adjacent nerves, to the tympanic membrane, the external auditory meatus, and the adjacent parts of the concha. Since then his syndrome has been generally recognised, and his explanation of it as a specific zoster infection of the geniculate ganglion is widely accepted. The extent of the zoster eruption varies a great deal, and the extent of the cutaneous supply of the seventh may also be presumed to vary; the question therefore arises whether any cases of this condition occur in which, owing to smallness of the cutaneous supply or for some other reason, the eruption is missing. If so, they would appear clinically, if the eighth nerve is not involved, as cases of ordinary Bell's palsy. Antoni [2] raised this question in 1919, but so long as the only known diagnostic characteristic of zoster was its eruption, it could not be answered. Recent serological work, however, has provided a new method of approach.

Although zoster is always included among the diseases due to filtrable viruses, direct evidence in support of this has not yet been produced. It is inferred from the failure of all efforts to find a cultivable bacterium in the fluid of early vesicles, and from the presence of nuclear inclusions, similar to those produced by the virus of herpes febrilis, in the epidermal cells of the lesions. In addition, Kundratitz [3] claims that, in a high percentage of susceptible children, zoster vesicle fluid inoculated into the skin produces a vesicular lesion, followed occasionally by a generalised eruption of a similar nature; more rarely the generalised vesicular eruption occurs without any preceding local lesion. Bruusgaard [4] has confirmed Kundratitz's findings. Netter [5] and his colleagues have produced evidence that the serum of zoster convalescents contains a specific antibody whose presence can be detected by the complement-fixation reaction, using as antigen diluted zoster vesicle fluid, or a suspension of crusts from zoster skin lesions. Lauda and Silberstern [6] failed to confirm this, but the observations of Bedson and Bland,[7] though limited to a small series, support Netter's claim, and in a series of 82 convalescent zoster patients shortly to be reported by one of us (R. T. B.) positive complement-fixation reactions were found in 80.

Zoster may therefore be regarded as an infection with a specific virus, which leaves evidence of itself, after the illness has passed, in the form of antibodies in the serum, and if any cases of Bell's palsy are due to this virus the complement-fixation reaction should reveal evidence of this.

We have carried out this reaction with sera of a number of such cases, using essentially the technique described by Bedson and Bland.[7] The specific antigen was a 1 in 20 dilution of vesicular fluid from early zoster lesions in M/50 phosphate buffer solution at pH 7·6. We also tried antigen prepared from the scabs of older lesions (Netter) but found them strongly anticomplementary and much less satisfactory than the diluted vesicular fluid. The antigenic potency of the latter varies considerably; hence, although Netter worked with a 1 in 100 dilution, and in one of our own cases a 1 in 160 dilution was found effective, we preferred to adopt a 1 in 20 dilution for routine use. The control antigen was a bullous fluid from the lesions of a patient with dermatitis herpetiformis, similarly diluted. Antigens were usually bacteriologically sterile, in which case, when stored in a refrigerator, they kept their antigenic properties for some months. The diluted antigens were tested

for anticomplementary action in the presence of 1 M.H.D. (minimum hæmolytic dose) of complement on the day of the test. Occasional samples proved to be anticomplementary but it was found that heating for ten minutes at 56° C. removed this property. The sera were used undiluted after having been inactivated by heating for 20 minutes at 56° C.

In each series of tests 0·1 c.cm. of the serum under investigation, 0·1 c.cm. of antigen, and 0·1 c.cm. complement (containing 2 M.H.D.) were mixed in that order, and the volume made up to 0·8 c.cm. with saline. After the mixture had stood two to three hours at room temperature, 0·2 c.cm. of sensitised sheep red cells was added, and the whole incubated at 37° C. for 30 minutes. The degree of hæmolysis was read immediately, and again after 24 hours in the refrigerator. With each group of sera the following controls were put up and treated in the same manner: at least one serum from a patient convalescent from ordinary zoster; at least one serum from a normal person or a patient who had not recently suffered from either zoster or chicken-pox; antigen and complement; antigen without complement; serum without complement; complement alone.

The cases fall into two clinical groups.

CASES WITH CUTANEOUS ERUPTIONS

Group I.—Eight cases of Bell's palsy with clinical evidence of cutaneous eruptions in the neighbourhood of the ear and one case with an eruption on the tongue. Their clinical features were briefly as follows:—

CASE 1.—A woman, aged 41, complained for two or three days of severe pain round the left ear, radiating down the neck and over the temple. Then a few "water blisters" appeared behind the ear and on the pinna, and others on the left upper arm, the left temple, and just inside the hair line on the left side of the head. She felt soreness inside the left external auditory meatus but there was no aural discharge. Severe pain persisted for 15 days, became worse on the sixteenth day, and on the seventeenth she woke with a complete left facial palsy. On examination the following day, slight œdema and marked tenderness were found over the mastoid process; small scabbed areas were present on the pinna and behind the ear; the drum was normal but a small vesicle was seen close to it on the posterior meatal wall. The œdema persisted for a week, and the pain, gradually diminishing, for a few days longer. The facial nerve recovered its function in about four weeks. Serum obtained seven weeks after the onset of the paralysis gave a positive zoster complement fixation.

CASE 2.—A man, aged 59, who had never had shingles and could not remember chicken-pox, complained for seven days of moderately severe aching pain extending from behind the left eye to below the left ear. Then he had a sore-throat, and two days later a left facial palsy appeared. About the same time a vesicular rash was observed, chiefly behind and below the left ear and in the concha, with outlying single vesicles above and in front of the ear, on the bridge of the nose, and above the left eyebrow. There was a slight discharge from the left ear, impairment of hearing on that side, and slight impairment of taste on the left side of the tongue. Serum obtained 12 days after the onset of the paralysis gave a positive zoster complement fixation. The eruption healed, but the face recovered only very slowly, being still weak 14 months later.

CASE 3.—A man, aged 57, suffering from tabes dorsalis, with positive Wassermann reaction in blood and cerebro-spinal fluid, complained one day of slight discomfort in the right external auditory meatus, and was found to have a right facial palsy. Two days later a crop of vesicles appeared round the external auditory meatus, and one vesicle just below and behind the lobule of the ear. There was loss of taste on the right side of the tongue. Serum obtained 20 days after the onset of the paralysis gave a positive zoster complement fixation. Five days after his eruption appeared, a nurse on duty in the ward where he was a patient developed a patch of herpetic vesicles over the sacrum, preceded by pain for one day; 11 days after this a boy, aged 8, a patient in the same ward, developed chicken-pox.

CASE 4.—A girl, aged 13, who had chicken-pox in infancy, but never shingles, complained of left-sided earache for about a week. She became ill, with vomiting, abdominal pain, and generalised headache, but with a reputedly normal temperature. Then her mother noticed several blisters containing watery fluid in the concha of her left ear. Three days later left facial paralysis occurred, after which the general condition gradually improved, though when she first got up she complained of giddiness and stumbling. Serum obtained 17 days after the onset of the paralysis gave a positive zoster complement fixation. Recovery was complete in about six weeks.

CASE 5.—A woman, aged 60, who had never had chicken-pox or shingles, complained of severe pain over the right ear and down the right side of the neck for one day, and then noticed right-sided facial paralysis. Shortly afterwards she felt, but did not see, a "pimple" in the floor of the entrance to the right external auditory meatus; it dried up, and a "scurfy patch came off." On examination four weeks later, an almost complete right facial paralysis was still present, but the ear appeared normal. Serum obtained then gave a partially positive zoster complement fixation. The pain lasted, with diminishing intensity, for about a fortnight.

CASE 6.—A man, aged 36, who had never had chicken-pox or shingles, woke one morning to find his right face paralysed and saliva dribbling from his mouth. Five days later he had a little transient pain below the right ear. Examination ten days after the onset showed an almost complete right facial paralysis without disturbance of taste, and a scaly, partly scabbed eruption in the concha of the right ear at the entrance to the meatus, on an area of raised red cracked skin. There was debris in the meatus; no actual vesicles were seen. The patient had first noticed this condition two days previously. Serum obtained ten days after the onset of the paralysis gave a positive zoster complement fixation. Recovery took about a month. He had had right-sided otorrhœa in childhood, with subsequent slight deafness.

CASE 7.—A man, aged 26, had complained for six months of "headache" in the right mastoid region, and for five years had had slight bilateral aural discharge. He had never had shingles and could not remember chicken-pox. He developed a cold, with a cough, and noticed a "queer taste" on the right side of his tongue. Five days later his right face became paralysed. Six days after that, examination showed a complete right facial paralysis, with no impairment of taste, and a slight scabbing on the posterior wall of the entrance to the right external auditory meatus. The drums showed signs of old chronic otitis media, without recent activity. Serum obtained nine days after the onset of the paralysis gave a positive zoster complement fixation. Recovery took about four weeks.

CASE 8.—A girl, aged 15, who had had chicken-pox in early childhood, but never shingles, had a little left-sided earache, and her mother noticed what she described as one or two "purulent spots" in the left external auditory meatus. Seven days later left facial paralysis appeared, and was almost complete when she was examined after a further interval of three weeks. She had no severe pain, and taste was unimpaired. Serum obtained then gave a positive zoster complement fixation.

CASE 9.—A girl, aged 13, who had had chicken-pox as a baby, but never shingles, developed a "cold," and complained for three or four days of a nagging pain over the tip of the right mastoid. Then the right side of the face suddenly became paralysed, and she noticed impairment of taste on the right side of the tongue. On examination four days after the paralysis, two yellow pin-head vesicles, very close together, surrounded by a red area, were seen at the tip of the tongue on the right side; serum obtained at the same time gave a positive zoster complement fixation. The vesicles disappeared in a few days; the paralysis persisted for at least two months, after which she was lost sight of.

These nine cases had cutaneous eruptions in the area of supply of the geniculate ganglion, which varied from obvious zoster vesicles to small areas of scabbing which, at the time of examination, could not clinically have been diagnosed with certainty as zoster, but which were suggestive of it. All of them gave positive zoster complement-fixation reactions (Table I.) in their serum, and in all it seems reasonable to attribute the facial palsy to an infection of the geniculate ganglion with zoster virus. More or less pain was associated with the onset in six of them, absent in three. In four recovery of muscular power took place in a few weeks; in one it was incomplete after 14 months; in the others its date was not ascertained. In four there was evidence of impairment of taste; in two taste was unimpaired;

in three there is no definite information. In general, therefore, the clinical features of the facial paralysis itself do not differ from those of the familiar Bell's palsy of unascertained origin.

TABLE I

Sera.	Antigens. Zoster vesicle fluid.	Antigens. Derm. herp. vesicle fluid.	Saline.
Case.	+ 2 M.H.D. complement.		
1	+ + + + / + + + ±	± / −	− / −
2	+ + + +	−	−
3	+ + + + / + + + +	+ + + / −	− / −
4 *	+ + + +	+ + + +	−
5	+ + + + / + + +	− / −	− / −
6	+ + + + / + + + +	+ + / −	± / −
7	+ + + + / + + + ±	− / −	− / −
8	+ + + + / + + ±	− / −	− / −
9	+ + + + / + +	−	−

Derm. herp. = Dermatitis herpetiformis.
The degree of fixation of complement (2 M.H.D.) is indicated by the signs, + + + + representing complete fixation. Where two rows of signs are given, the upper is the reading after 30 minutes at 37°, and the lower is the reading after 24 hours at 0° C. (approx.). The other controls not shown in the Table were uniformly negative.
* In this case the control antigen was strongly anticomplementary, but complete fixation with zoster was also given when 3 M.H.D. and 5 M.H.D. of complement were used; the result has therefore been regarded as positive.

CASES WITHOUT CUTANEOUS ERUPTION

Group II.—Twenty-two cases of facial palsy with no clinical evidence of cutaneous eruption in the neighbourhood of the ear. These were of the familiar clinical type and need not all be recorded in detail. Eruptions of the kind found in the first group were absent, with two doubtful exceptions; in one of these a pustule (not a blister) occurred behind the ear and a "sore place with a whitish centre" on the tongue, two days before the paralysis; in the other the patient noticed one or two small blisters on the outer part of his forehead a week after the occurrence of the paralysis. Fourteen of the patients were women, eight men, and their ages varied from 13 to 60. Ten had associated pain, usually in the ear or mastoid region, sometimes in the neck or along the lower jaw; seven gave definite evidence of disturbance of taste. In 14 recovery was known to have occurred within two months; in three, very little improvement could be detected after two months, but two of these recovered in six months; in the rest information is lacking.

In 18 of these cases (including the two with doubtful eruptions) serum obtained between 9 and 30 days after the appearance of the paralysis gave no zoster complement fixation, and infection with zoster virus would therefore seem to be an unlikely cause of the paralysis.

In the remaining four positive zoster complement fixations were obtained. The clinical details are as follows:—

CASE 10.—A young man, aged 19, who had never had shingles and could not remember chicken-pox, developed a left facial paralysis without pain or other symptom. It had improved considerably by the time he was examined, seven days later, and disappeared in a month. Taste was not affected. A partially positive complement fixation was obtained in serum taken two months after the onset.

CASE 11.—A woman, aged 44, who had never had chicken-pox or shingles, complained of slight bilateral earache for three days, and then developed right facial paralysis. Syringing the ears removed much wax, chiefly from the left. Aching persisted in the right ear, spreading down the neck, for several days longer. Taste was impaired on the right side of the tongue. Serum obtained four days after the onset of the paralysis gave a positive zoster complement fixation. Recovery was gradual.

CASE 12.—A woman, aged 47, who had had chicken-pox in childhood, but never shingles, after two days' severe headache (not earache) of a kind from which she often suffered, developed a right facial paralysis, with a slight sore-throat. Taste was not affected. Serum obtained 15 days later gave a partially positive zoster complement fixation. Recovery took two months.

CASE 13.—A woman, aged 56, who had never had chicken-pox or shingles, suddenly developed a complete left facial paralysis, with some subsequent aching in front of the ear. Taste was unimpaired. Serum obtained 21 days later gave a positive zoster complement fixation. Recovery had not begun in two months.

Clinically, these four cases differ in no characteristic way from the rest of the group. The positive zoster complement fixations (see Table II.) strongly suggest

TABLE II

Sera.	Antigens. Zoster vesicle fluid.	Antigens. Derm. herp. vesicle fluid.	Saline.
Case.	+ 2 M.H.D. complement.		
10	+ + + + / +	− / −	− / −
11	+ + + + / + + + +	− / −	− / −
12	+ + + ± / + + ±	− / −	− / −
13	+ + + + / + + + ±	− / −	− / −

For explanation of the signs see Table I.

a zoster infection as the cause of the paralysis. There was no history and no sign of any skin eruption in, on, or near the ear, nor of an eruption on the tongue, but the possibility of an eruption confined to the deeper parts of the external auditory meatus was not excluded.

The 22 cases of this whole group were random cases of Bell's palsy, without cutaneous eruption suggestive of zoster. The serological investigation shows that zoster virus is a possible or probable causative agent in a relatively small proportion of such cases. That proportion is approximately 18 per cent. in this short series, but we have excluded from it 14 other negative cases, otherwise admissible, for the reason that their sera were examined between three and nine days after the appearance of the palsy; antibodies may develop within that period, but their absence in a given case cannot be considered reasonably certain unless the examination is made after the ninth day. We feel, therefore, that a longer series of cases might possibly show an incidence of zoster infection lower than 18 per cent., rather than higher.

Many of the cases in Group I., with cutaneous eruptions, were specially referred to us (Nos. 1 and 3 from Maida Vale Hospital by Dr. Blake Pritchard, to whom we are much indebted); hence the percentage of cases presenting the Ramsay Hunt syndrome in our series has therefore no bearing on the true incidence of such cases in an unselected group of patients with Bell's palsy.

SUMMARY

1. The sera of nine cases of Bell's palsy with zoster-like eruptions in the areas of sensory supply of the geniculate ganglion have been found to contain antibodies to zoster virus, demonstrable by complement

fixation. This is serological evidence supporting Ramsay Hunt's clinical explanation of such cases as due to specific zoster infection of the geniculate ganglion.

2. The sera of 22 cases of Bell's palsy without zoster-like eruptions have been found to contain zoster antibodies in only four instances. Our evidence thus suggests that the majority of such cases are not due to an infection with zoster virus.

We wish to acknowledge with gratitude a great deal of help and advice given us by Dr. S. P. Bedson, of the Freedom Research Laboratory in the London Hospital. One of us (R. T. B.) was assisted by a grant from the Yarrow Research Funds.

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Clinical and Laboratory Notes

A STAINING METHOD FOR THE DIRECT TYPING OF PNEUMOCOCCI

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An important advance in the serum treatment of lobar pneumonia was made when Armstrong [1 2] and Logan and Smeall [3] in simultaneous papers showed that the direct typing of pneumococci in sputum was possible. However it is not always easy, at least for the unpractised eye, to recognise the unstained swollen capsules on which their method depends.

The object of the present communication is to point out that the "neutralised" capsule can be stained by ordinary dyes. The following technique is simple and reasonably quick.

Three or four loopfuls of Type I. serum are mixed on a slide with a fair-sized loopful of sputum and mounted with a cover-glass. The edges of the cover-glass are sealed with vaseline, so that it will not become stuck to the slide. Similar preparations are made with Types II. and III. sera. It is essential that complete neutralisation of the capsule should be obtained, and to ensure this the preparations should be left for 20 to 30 minutes. After this the cover-slips are slid off and discarded. The films left on the slides are allowed to dry and the bulk of the vaseline is scraped off with a knife. The vaseline remaining will not interfere with the staining and blotting of the slides, and it may finally be removed by warming until it is just melted and washing over with xylol. Before staining wash the film under the tap to remove the serum, stain for 2 to 3 minutes with dilute carbol fuchsin, wash and counter-stain for 10 seconds with carbol thionin; wash and blot dry.

It will be found that the bodies of all bacteria stain practically black, and that everything else is red. The capsules of pneumococci treated with the homologous serum appear quite large and stain a strong red, whereas the "unneutralised" capsule does not stain.

The dilute carbol fuchsin used has been filtered Ziehl-Neelsen stain freshly diluted in a test-tube with five or six parts of water. The carbol thionin contains nine parts 5 per cent. phenol in water and one part 50 per cent. alcohol saturated with thionin. In a new bottle this stain usually precipitates, but once the bottle is lined with deposit it lasts well. Saffranin may be used in place of carbol fuchsin, but the capsules are then less intensely stained. Tap-water may be used for washing slides throughout.

Similar methods are very successful in typing the pneumococci in pus, but in this case a few cocci may be seen with lightly stained capsules in mixtures with the heterologous sera. This is probably due to the fact that the patient has had time to produce some antibodies, but it does not appear likely to cause confusion.

When pneumococci cannot be found in sputum and mouse inoculation is inconvenient, a serum agar slope may be inoculated with a good loopful of sputum and the culture washed off in a little saline next day. The presence of a few pneumococci may be gauged by making a film from a loopful of the suspension mixed with a loopful of normal serum, and staining with carbol thionin or other stain capable of fixing the serum. Capsules will show as an unstained halo round the cocci. Unstained zones can, of course, occur in such a film round other bacteria owing to retraction, but a very little experience will enable the pneumococci to be identified. If they are present, equal volumes of suspension and of the type sera may be mixed and sealed in capillary pipettes. Films are made after about 15 minutes, washed and stained as for sputum. Capsules from cultures are considerably narrower than those from sputum or pus but are quite recognisable. It must, of course, be recognised that such a method is inferior to mouse inoculation, both in disclosing the presence of very small numbers of cocci and also in providing no test of virulence.

Where large numbers of pneumococci are present, as in pure cultures or in the peritoneal exudate of mice, it is only necessary to spread films of the organisms in loopfuls of the type sera and stain with carbol thionin. With homologous serum massive agglutination takes place, usually visible to the naked eye.

Capsular staining, although unmistakably present in the agglutinated cocci, is usually less striking than in sputum owing to incomplete "neutralisation" and insufficient antibody, but the agglutination alone will readily identify the type. This latter reaction has been previously described by Sabin,[4] who obtained no capsule staining.

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MYELOID LEUKÆMIA TREATED WITH THE FOUR-GRAMME RADIUM BOMB

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The treatment of leukæmia by radiation is now firmly established. No case is cured; it is open to question whether life is prolonged at all. The superiority of radiotherapy over all other forms of treatment is that it can produce in these patients a temporary return to apparent health.

The cause of this condition is unknown, although several theories of its origin have been advanced from time to time. At the moment the balance of opinion seems to be divided between an inflammatory condition of the hæmopoietic system and a neoplastic one. Very little is known of the way in which X rays

or the gamma rays of radium produce their biological effects. The treatment of a case of leukæmia by radiation therapy is, therefore, so far entirely empirical.

The case described here is one of myeloid leukæmia treated with a mass of 4 g. of radium. The spleen was the only part of the hæmopoietic system treated, and the reduction in the size of the spleen and in the number of the white blood corpuscles was taken as a guide to the response of the condition to treatment.

CASE RECORD

History.—The patient, a man aged 60, gave a history of having had "rheumatism" for several years, and a *B. coli* infection of the urinary tract in 1927. In June, 1929, he had had sciatica on the right side, treated by injection without relief. His teeth had been examined but were not extracted. In March, 1930, he consulted a

FIG. 1 FIG. 2

Photographs showing reduction in size of spleen after a week's treatment.

doctor in Nice on the grounds of failing general health. Medical examination revealed a greatly enlarged spleen, and a blood count at the time showed the following:—

Red cells	3,286,000	Polymorph (neutro.).	69%
White cells	195,000	,, (eosino.).	8%
Hæmoglobin ..	90%	,, (baso.) ..	2%
Colour-index ..	1·3	Myelocytes (neutro.).	20%

He was advised to go to Paris for radiological treatment, but refused. In September, 1930, he was examined in England; the French findings were confirmed. At this time he complained of being easily tired, was constipated, had an indifferent appetite, and became short of breath on slight exertion. He was, however, well enough to play golf.

On examination in October, 1930, his general condition was good, the tongue clean, and the teeth showed slight sepsis. The chest was clear, the heart sound and the blood pressure 130/90. The spleen was very enlarged, extending inwards to the umbilicus and downwards to the iliac crest. The surface of the spleen was smooth and the notch easily palpable.

FIRST COURSE OF TREATMENT

On Oct. 16th, 1930, treatment of the spleen with a mass of 4 g. of radium was commenced. The radium consisted of 20 tubes of 200 mg. each, arranged in a horizontal circle; the radium-skin distance was 9 cm. The total filtration was equivalent to 1 mm. platinum, and the port of entry was a circle 15 cm. in diameter. The spleen was irradiated from the front and back, an exposure of two hours daily being given for seven days, giving in all a total dose of 56,000 mg. hours. Blood counts were done daily. The number of the white cells was reduced after seven days of treatment from 338,000 to 61,000, corresponding to a drop of over 30,000 white corpuscles per day. The white cells continued to decrease for some time after the cessation of treatment.

At the end of treatment the general condition was very definitely improved. The patient felt well, his breathlessness had cleared, and he was very markedly less easily tired. This improvement had occurred without any obvious improvement in either the red cell count or the hæmoglobin index. The reduction in the size of the spleen had been considerable, as is well shown in the photographs taken on Oct. 17th and on Oct. 25th, the day on which the patient left hospital (Figs. 1 and 2).

SECOND COURSE OF TREATMENT

Six months later, on May 5th, 1931, another blood count was done and this showed: hæmoglobin, 86 per cent.; colour-index, 0·6; red cells, 5,580,000; and white cells, 186,000.

Generally his condition was very good, and he was able to pursue his usual activities. The spleen had become enlarged to its previous size. Distance radiation with 4 g. of radium was again instituted, treatment being commenced on June 16th, 1931. The spleen was irradiated on this occasion from the front only, the same apparatus and a radium-skin distance of 9 cm. again being used. He received exposures of only one hour on each of the following days, June 10th, 12th, 15th, 22nd, and 24th, giving a total dose of 20,000 mg. hrs. The result was a very considerable drop in the white cell count.

During this period some interesting observations were made. On June 22nd leucocyte counts were done immediately before and after an hour's application of the bomb. The results are given below. A drop of just over 20,000 had been obtained after one hour's exposure. A repetition of this two days later indicated a similar reduction.

June 22nd

2.50 P.M.		3.50 P.M.	
White cells	92,000	White cells	66,000
Polymorphs—		Polymorphs—	
Neutrophil ..	72·5%	Neutrophil ..	61·5%
Eosinophil ..	1·0%	Eosinophil ..	1·0%
Basophil	5·0%	Basophil	9·0%
Myelocytes—		Myelocytes—	
Neutrophil ..	13·5%	Neutrophil ..	25·5%
		Eosinophil ..	2·5%
Lymphocytes ..	0·5%	Lymphocytes ..	0·5%

June 24th

2.50 P.M.		3.50 P.M.	
White cells	91,000	White cells	70,000
Polymorphs—		Polymorphs—	
Neutrophil ..	83%	Neutrophil ..	83%
Eosinophil ..	0·5%	Eosinophil ..	1%
Basophil	2·0%	Basophil	1%
Myelocytes—		Myelocytes—	
Neutrophil ..	12%	Neutrophil ..	13%
Lymphocytes ..	1·5%	Lymphocytes ..	2%

Radiation was stopped on June 24th, when the leucocytes had decreased from 170,000 to 91,000. The spleen had again been reduced in size, being now scarcely palpable. The drop in the leucocytes continued for some days after the treatment was stopped.

THIRD COURSE OF TREATMENT

The patient was seen again four months later, on Oct. 20th, 1931. The clinical picture was similar to that present at the commencement of treatment: shortness of breath on exertion, fatigue, and a greatly enlarged spleen. At this time, however, there was some deterioration in his general condition; he was obviously not as fit a man as he had hitherto been. He himself affirmed that he did not feel really worse, and was able to lead quite a normally useful life. A blood count taken at this time was as follows:—

Red cells	4,370,000	Polymorph (neutro.) .	58%
White cells	257,000	,, (eosino.) .	1%
Hæmoglobin ..	66%	Myelocytes (neutro.) .	30%
Colour-index ..	0·7	Myeloblasts	10%
		Lymphocytes	1%

He was readmitted to Westminster Hospital Annexe on Nov. 11th, 1931, and distance radium radiation was commenced on the next day. Employing again the same apparatus at a radium-skin distance of 9 cm., exposures of one hour's duration were given daily to the spleen from the front, for a period of eight days, corresponding to a dose of 32,000 mg. hrs., followed later by four further treatments of one hour each at weekly intervals. After irradiation the leucocytes dropped to 35,000, and the drop continued after the end of treatment to 17,000 on Jan. 7th, 1932. There was also a very marked improvement in the red cell count and hæmoglobin, the red cells rising from 3,870,000 on Dec. 12th, 1931, to 6,120,000 on Jan. 7th, 1932. His general condition was good, and the spleen, previously much enlarged, was no longer palpable. Three weeks later, on Jan. 28th, his general condition was very good, and the spleen was still not palpable. A blood count at this time showed the total number of leucocytes to be 26,000.

On March 17th the patient was in excellent health. He looked well and felt well, and stated that he was able to

play a considerable amount of golf with no discomfort. The spleen was still not palpable. A blood count done at the time, however, showed a leucocytic rise: hæmoglobin, 84 per cent.; red blood corpuscles, 5,000,000; white cells, 123,000.

When seen on March 30th he complained of fatigue and shortness of breath, and his general condition was again deteriorating. The spleen was just palpable and the leucocytic count was 123,000. The spleen was again irradiated with 4 g. of radium from the front. He was given an exposure of one hour daily for three days. The leucocytes on April 4th were 103,000, and on April 12th 105,000. The spleen, however, was not palpable. He was given three more hours' irradiation.

The patient returned to Australia in May, 1932. Owing to lack of radium, further radium treatment was not possible. On his return he received deep X ray therapy to the spleen, and his leucocytes dropped from 170,000 to 19,000 without undue shock. The patient stated that he was feeling better then than he had been for the last three years. In August, 1932, he apparently developed phlebitis in both legs, which was reported to be improving; also marked dental sepsis was being attended to.

The chief point of interest about this case is that the patient was treated, up to the time of his return to Australia, by means of distance mass radiation with 4 g. of radium. Cases treated by the surface application of radium have been described, but I have found no record of a case of splenomedullary leukæmia treated by a "bomb."

I wish to acknowledge my indebtedness to Mr. Stanford Cade for allowing me to publish this case.

THE OCCURRENCE OF GOUT DURING THE TREATMENT OF PERNICIOUS ANÆMIA

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THE following case is of interest in view of the fact that it has been shown by Riddle [1] that the level of the blood uric acid rises in pernicious anæmia 24 hours after treatment with liver extract has been commenced, and reaches a maximum just before the peak of the reticulocyte crisis.

Further, Spence,[2] in discussing the effects of treatment in 20 cases, stated that harm may result from taking too much liver after the stage of cure has been reached. He mentioned three instances in which patients had taken 1 lb. of liver daily for three months after the blood-cells had reached their normal level; two of these patients developed acute gout; the third, venous thrombosis with œdema of both legs.

I have not been able to find any other references to the development of gout in pernicious anæmia, although Davidson and Gulland [3] mention its occurrence.

CASE RECORD

A man, aged 49, was admitted to Mile End Hospital on May 4th, 1932. For several months before admission he had complained of shortness of breath and loss of weight. Three weeks previous to admission he had some dental extractions which aggravated the condition.

Previous history.—Gun-shot wound of the left arm and gassed during the war. No history of any serious illnesses.

Examination.—Moderate physique, but evidence of some loss of weight. There was general pallor of the mucous membranes with a lemon-yellow tint of the skin. Slight icterus was evident in the conjunctivæ. Heart: rate regular, not enlarged, no bruits, but sounds rather distant. Alimentary system: edentulous; tongue smooth, but no symptoms of glossitis; lower edge of liver just palpable; spleen not felt. Central nervous system: no abnormal physical signs detected.

A *fractional test-meal* showed achylia gastrica (no neutral red secreted). *Radiography* of the stomach and duodenum showed nothing abnormal. In the stools no occult blood was found.

A blood count gave the following results:—

Hæmoglobin	31%	Polymorphs	47%
Red cells	1,650,000	Small lymphocytes	32%
White cells	6,800	Large lymphocytes	17%
Colour-index	0·94	Hyalines	4%
Reticulocytes	6 per 1000 red cells.		

Red cells showed marked anisocytosis, poikilocytosis, polychromasia, and punctate basophilia. A few nucleated red cells were present. The cells appeared to be of a macrocytic type.

Subsequent progress.—The patient was given ventriculin, four doses daily (40 g.) for five days; the dose was then reduced to 30 g. daily. A marked reticulocyte response was obtained which began on the fourth day and reached its maximum on the sixth day, when the reticulocytes numbered 114 per 1000 red cells. The hæmoglobin rose slowly but steadily, and the red cells after a preliminary drop of 600,000 increased from 1,650,000 to 3,300,000 per c.mm. in 65 days. On the sixteenth day of treatment ½ lb. of liver was added to the diet.

On the thirty-sixth day after liver treatment had commenced he had an attack of gout which affected the metatarso-phalangeal joint of the left great toe and was characterised by pain, swelling, and redness of the joint, lasting three to four days, and then subsiding without leaving any evidence of the lesion. There was no previous history of gout nor any evidence of a gouty diathesis. The arteries appeared healthy and no tophi could be found. Estimations of the uric acid in the blood and urine were not made at this time. Two months after the attack of gout, however, the blood uric acid was found to be raised slightly to 5 mg. per 100 c.cm.

The patient continued to make good progress. The lemon-yellow colour of the skin disappeared, and the icterus of the conjunctivæ was lost. Liver treatment was discontinued on July 18th, having been taken for eight weeks, and Marmite, 6 g. daily, was then given in addition to 20 g. of ventriculin.

I am indebted to Dr. Alan Randle, medical superintendent of Mile End Hospital, for permission to publish this case.

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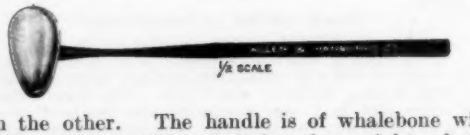
NEW INVENTIONS

A POCKET PERCUSSOR

THE neat percussor shown in the illustration can be carried in the waistcoat pocket. It measures exactly 5 in. long and has a nickel plated metal acorn-shaped head 1 in. long by ½ in. broad at its middle. One end of the acorn is rather more rounded



than the other. The handle is of whalebone with tapering butt. Although light, the weight of the head alone is sufficient in use. Most percussors are too large and clumsy and not readily available when most needed. Their large size and rubber attachments rather invite roughness in use.

The instrument is made by Messrs. Allen and Hanburys, Bethnal Green, London, E.

S. Watson Smith, M.D., F.R.C.P. Edin.

REVIEWS AND NOTICES OF BOOKS

A System of Surgery

Third edition. Edited by C. C. CHOYCE, C.M.G., C.B.E., B.Sc., M.D., F.R.C.S., Professor of Surgery, University of London, Surgeon to University College Hospital. Pathological Editor: J. MARTIN BEATTIE, M.A., M.D., C.M., M.R.C.S., Professor of Bacteriology, University of Liverpool. London: Cassell and Co., Ltd. Three volumes. 1932. Pp. 3330. £6.

Choyce's surgery was recognised as a magnificent achievement from the day of its publication. It reflected all that was good in English and foreign practice, it omitted nothing of any account, it maintained a uniformly high standard, and some of its articles indeed were the finest of their kind in the English language. It was, moreover, excellently printed and illustrated. It seemed almost impossible that future editions should keep to this high level of accomplishment; yet this has been achieved. Some of the original contributors are unfortunately no longer alive, while others are now taking a less active part in surgery, so that the services of new writers had to be enlisted. The editor has chosen these with discretion, and under his supervision the added matter has been welded into the whole. It is impossible to review each section in detail. All the original contributors who have undertaken the work of revision seem to have done it well. Attention therefore is directed to the articles by new authors.

Dr. G. E. Birkett's article on radium is well considered and balanced, emphasising as it does the accurately known facts of radiotherapy. It is sad to reflect that future editions will not have the assistance of this brilliant worker. The subject of radium and X ray burns is well treated by a new contributor, Mr. A. J. Gardham, who writes also of burns in general, giving a good account of modern treatment. Mr. J. B. Hunter has ably revised the chapter on the clinical course and treatment of inflammation. Venereal diseases other than syphilis are described by Mr. A. H. Harkness, obviously from a large experience. The account of gonorrhœal arthritis, however, is not adequate, for to acute arthritis only three and a half lines, to hydrarthrosis two and a half lines, and to polyarthritis one and a half lines are devoted. In the notice of acute epididymitis the views of surgeons who believe in puncture or incision are not mentioned. The author has probably found no advantage to be derived from them. We note also his belief that there is no place in the treatment of these diseases for vesiculotomy, vasostomy, or catheterisation of the common ejaculatory ducts. This article is marred by such sentences as "the best treatment of this condition is to avoid it" (p. 809) and "a diagnosis of prostatitis is seldom wrong if during a course of irrigations the urine passed into both glasses is muddy" (p. 791), where the meaning is rather obscure.

Prof. A. K. Henry contributes an excellent article on surgical diseases caused by animal parasites. We were unaware that the British weever fish may cause so much pain by its sting that its victim has leapt overboard in his agony, and that this pain can be immediately relieved by an injection of potassium permanganate. Local anæsthesia is described by Mr. H. N. Webber, who also writes on spinal anæsthesia. Both these articles are thoroughly up-to-date, but we regret to see the large bore Barker needle still advocated for puncture of the dura. Apparently the author has no objection to a combination of general and spinal anæsthesia, a procedure which would seem to put a very serious strain on the resources of a patient.

In Volume II. Prof. D. P. D. Wilkie has revised the article on diseases of the tongue. The account of lingual cancer is made valuable by the considered judgment on the use of radium. It is well to be reminded that there are some types and situations where the knife is still to be preferred. The author gives rather a scrappy account of the removal of glands on page 125, and the reader might think from his description that the internal jugular vein should be removed on both sides. In one place there seems to be a mistake in the dose of radium for sarcoma. We do not think it sufficiently emphasised that the essential step in the successful removal of a thyroglossal cyst is the excision of a portion of the body of the hyoid bone. It is only suggested that division of the hyoid may be necessary for access. This article would be more useful if formulæ for the paints, ointments, and solutions recommended in treatment were more regularly supplied. It is of interest to learn that radium tends to make leukoplakia worse after an occasional temporary improvement. Mr. H. S. Souttar's contribution on the œsophagus is well planned and balanced. He is not sanguine as to the prospect for surgery in carcinoma of the œsophagus, though due notice is taken of the rare successes of excision. The difficulties of radium treatment are fairly expounded.

The splendid article on the stomach originally contributed by James Sherren has been revised by Mr. A. J. Walton. Sherren's article was above all an account of personal experiences to which it owed so much of its attraction and value. Mr. Walton has tried to maintain its character, but has not been quite successful; he would have been better advised to rewrite the whole article from his own extensive experience. The cauterisation of an adherent chronic gastric ulcer combined with gastro-jejunostomy (p. 251) is a recommendation which few, if any, surgeons follow. Nor do we think in operating upon a perforated gastric ulcer many search for disease of the gall-bladder and appendix (p. 256), whilst it is curious to read that "when the ulcer which has perforated is a chronic one, if the condition of the patient will permit it should be treated as ulcer without this complication." Does the author really mean that he advises a partial gastrectomy? It seems likely that he does, for the matter is referred to again rather obscurely under "ultimate prognosis" on page 257. The statement that duodenal ulcer is most commonly situated on the anterior wall of the first part of the duodenum is still adhered to, although it is contrary to the experience of pathological anatomists in the post-mortem room and to that of surgeons who expose the pancreatic wall of the duodenum in their operations. Modern statistics do not support the claim on p. 263 that at least 90 per cent. of cases of duodenal ulcer can be cured by gastro-jejunostomy. Even if they were only mentioned to be condemned, the experiences of von Eiselsberg, Finsterer, Clairmont, and other continental surgeons in resection operations for duodenal ulcer might fairly be looked for in a text-book of these dimensions. The treatment of gastro-jejunal ulcer is rather inadequately described; we read that "this should be preventive," a misuse of words, and "the whole abdominal cavity should be

investigated and any other disease there present dealt with." It would be interesting to hear what other disease in the abdomen causes a gastro-jejunal ulcer.

The section on the intestines has been revised by Mr. K. Paterson Brown, who has ably maintained the standard of the original article. The account of intestinal obstruction is one of the best chapters in the book, and is beautifully illustrated. Since the last edition the importance of chloride therapy in this condition has become clear. Alkalæmia is indeed mentioned as one of the adverse factors in obstruction on page 357, but under treatment, later on, we are not told how to combat it. On page 400 we are informed that in post-operative obstruction abdominal pain and colic are seldom complained of. If the author is thinking only of paralytic ileus this may be true, but the statement as it stands is certainly not. Ileo-sigmoidostomy recommended for colitis has been abandoned, and rightly so. It is a little disappointing that in the otherwise excellent account of carcinoma of the colon only 36 lines are devoted to surgical treatment. This section could have been expanded with benefit.

Mr. B. W. Williams now takes part in the chapters on the appendix and peritoneum. Belonging to a school where the delayed treatment is practised, it is not surprising that he gives a good account of this, and categorically states that the difficulties and complications directly attributable to the operative interference outweigh those of the disease. His case is weakened, however, by the subsequent admission that some cases demand operation owing to spreading peritonitis, and that none can foretell what the course of any individual case will be. The statement made on page 446 that it should not be necessary to open a pelvic abscess through the rectum or vagina surprises us. Murphy's method of proctoclysis is not quite correctly described on p. 473; 1 to 2 feet head of water is too great a pressure to use. Murphy insisted on only a few inches to avoid soiling of the bed, and to allow of the expulsion of flatus. Many surgeons find that water is much better than saline solution, which leads to the introduction of too much chloride.

In Vol. III. Mr. Geoffrey Jefferson has written the chapter on peripheral nerves—providing a straightforward modern account of this difficult branch of surgery. Mr. W. Trotter's article on the scalp, skull, and brain remains, under the revision of Mr. Julian Taylor, one of the best to be found anywhere. We note that injection of the Gasserian ganglion is not regarded here as successful as other reports would indicate. We could find no account of the technique of ventriculography or of the increasing use of diathermy in cerebral surgery in recent years. Mr. Taylor also coöperates in the chapter on the spine with happy results.

It requires careful and close reading of this textbook to reveal the passages which might be improved, whilst there is abundant and obvious occasion for praise. Prof. Choyce deserves warm congratulation upon the manner in which he has carried out a task of immense magnitude.

Synthetic Anatomy

By J. E. CHEESMAN, Deputy Medical Officer of Health for Leyton. London: Baillière, Tindall and Cox. 1932. 156 plates. 42*s*.

Dr. Cheesman's ingenious work is now complete. Many students and others who have derived help from the study of these transparent drawings will be pleased to have the full number in their possession. They are intended to supplement, not to supplant, orthodox methods of teaching anatomy, and are admirably planned to serve this end. Part X., the Brain, the last to appear, is sponsored in a foreword by Dr. G. W. B. James, while Prof. J. E. Frazer has contributed an introductory note to the whole series. There can be no doubt that many, in this and in other countries, to whom the descriptive anatomical structure of the body was little more than one of the painful necessities of a medical education, have been led by the examination of these plates to a better way of thinking. The clearness and accuracy of the drawings of the successive layers have had much to do with this result. The author and the publishers are to be congratulated on the completion of this work.

Diseases of the Blood

Second edition. By A. PINEY, M.D., M.R.C.P., M.R.C.S., Director of the Pathological Department, the Cancer Hospital, London. London: J. and A. Churchill. 1932. Pp. 310. 18*s*.

Dr. Piney prefaces the second edition of his book on diseases of the blood with the statement that he only puts forward such views as are commonly accepted. Perhaps as one of those hæmatological enthusiasts he describes as gazing through "charmed magic casements, opening on the foam of perilous seas, in fairy lands forlorn," he has not had the opportunity to keep pace with the more mundane observations of clinical workers. Certainly it is hard to believe that all his statements will meet with general acceptance. He gives a full account of the development of the cells of the blood followed by an analysis of the ever-growing number of blood diseases. Some conditions, like status lymphaticus, whose very existence is denied by many pathologists, are included without question. The hæmatological and anatomical findings, together with possible treatment, are discussed and in many cases fully illustrated from the author's own case-records.

The definition of Banti's disease as a primary disease of the spleen, without qualification, is a bold assumption. Many observers believe that the splenic enlargement is only secondary to some form of portal obstruction. The typical cells of Gaucher's disease are usually thought to contain a phospholipin; Dr. Piney states, without producing any fresh evidence, that the characteristic content is an albuminous substance. His dogmatic statements about acholuric jaundice are equally surprising. Gänsslen has described a large group of cases with no splenic enlargement, while latent cases may present no anæmia.

Misstatements of fact as regards ætiology and treatment are unfortunate in a book which will appeal to the general practitioner. No mention is made of the remarkable therapeutic value of small and repeated blood transfusions in icterus gravis of the new-born. The anæmia of infancy is not regarded to-day as a physiological anæmia. It has been shown by H. Mackay and other observers to be dependent upon a deficiency of iron and to be readily relieved or prevented by the administration of iron alone. On one page Dr. Piney describes it as physiological and likely to be relieved by iron, on the next as "due not only to an iron deficiency." The literature contains scanty evidence that liver extract alone is helpful in treating post-hæmorrhagic anæmias, either clinical or experimental, while iron in adequate amounts, especially if given in conjunction with whole liver, is a powerful aid in blood regeneration. Dr. Piney advises the administration of liver extract, but omits all mention of iron. He is surely unduly

pessimistic when he states that "we are completely ignorant as to the mechanism by which the number of leucocytes in the circulation is regulated." The work of Doan, Parker, and Jackson has not only indicated one factor in this regulating mechanism, but has given us a powerful therapeutic agent in certain disturbances of the mechanism. The use of nucleotide is one of the most interesting advances in recent hæmatology.

The book is pleasantly illustrated with the portraits of men who have contributed much to modern understanding of blood diseases. We hoped to find their teaching on the printed page but were disappointed. The chapters are headed with quotations from the poets—"I can be nothing at all, if it is not critical wholly" should be taken as a warning by readers.

Studien über die Entstehung und den Verlauf der Lungenkrankheiten

Second edition. By N. PH. TENDELOO, Professor der allgemeinen Pathologie und der pathologischen Anatomie, Direktor des Pathologischen Instituts der Reichsuniversität, Leiden. Munich: J. F. Bergmann. Pp. 219.

THIS book is one of a small and select company of text-books of pathology which approach the origin of pulmonary disease primarily from the point of view of physiology and function. Broadly speaking, the work may be divided into three portions—an introductory physiological section, a second section dealing with the morbid anatomy of emphysema, and a third section which occupies the major part of the book, devoted to infectious pulmonary diseases. One of the most important parts of the introductory section is a very full account of the mechanism of respiration looked at from the point of view of a pathologist who is primarily interested in impaired function. Another valuable contribution in this section is the long discussion on the inhalation of dust and the pneumonoconioses. Based largely on the early work of Arnold, this particular section will be read with profit by all whose work demands a special interest in industrial respiratory disease.

The section on infectious pulmonary diseases, after a short introduction on the physical and biochemical aspects of these conditions, is devoted to a long and detailed inquiry into lobar pneumonia, bronchopneumonia, and atypical pulmonary inflammations such as infection of the lung in influenza, psittacosis, the typhoid group of diseases, and in plague. It also deals briefly with rare conditions which are not too easy to define clearly, such as "asthenic or adynamic pneumonia," "nervous pneumonia," "abortive pneumonia." The last portion of this section of the book is devoted to a discussion on pulmonary tuberculosis. Throughout this long section Prof. Tendeloo focuses the attention of the reader on a series of questions which are repeated in italics at the head of each subsection. These deal with such matters as the point of origin of the infectious disease; the way in which it extends; the infective agent; the site of the primary and secondary infection; the influence of the various pathological factors on secondary infection; and the significance of the infection in determining the nature of the tissue change. With slight modifications these questions constitute the framework on which the descriptions and discussions are based. Naturally much more emphasis is laid on the soil than on the seed, the latter being a purely bacteriological matter with which the writer is not so much concerned. There is a good bibliography of the earlier work, but we found a little disappointing the omission of references to the recent work on pulmonary asbestosis and on silicosis. Presumably the author regards primary pulmonary neoplasms as outside the scope of the book.

Nervous Disorder in Infancy and Childhood

By NEILL HOBHOUSE, M.D. Oxf., M.R.C.P. Lond., Physician to Out-patients, Victoria Hospital for Children; Assistant Physician, West End Hospital for Nervous Diseases. London: H. K. Lewis and Co., Ltd. 1932. Pp. 212. 8*s*. 6*d*.

IN this small book Dr. Hobhouse has provided an excellent survey of ground which lies within the province of both neurologist and pædiatrician, and which is seldom thoroughly explored by either. Without entering more deeply into the pathology of the conditions he describes than is necessary for their clinical appreciation, Dr. Hobhouse presents his subject in a way that cannot fail to interest the practitioner. "Nervous disorder" is used in the widest sense, to include both conditions having a demonstrable organic basis and those lying in the borderland between neurology and psychology. A brief outline is given also of the more important psychoneuroses manifested in childhood, and a final section is devoted to mental arrest and deficiency. The presentation of such controversial matters as the causation of the infantile cerebral palsies is excellent, and the book as a whole is admirably balanced.

Human Cancer

BY ARTHUR PURDIE STOUT, M.D., Associate Professor of Surgery, College of Physicians and Surgeons, Columbia Hospital, N.Y. London: Henry Kimpton. 1932. Pp. 1007. 45*s*.

THIS elaborate monograph deals with human cancer and human cancer alone. No space is devoted to generalities, and no attempt is made to treat malignant disease as a biological and experimental problem. After the briefest introduction, Dr. Stout describes the disease as it affects various tissues and organs of the body. The scope of the work is indicated by its sub-title, "Etiological Factors; pre-cancerous lesions; growth; spread; diagnosis; prognosis; principles of treatment." Some regions of the body are naturally treated in much greater detail than others. Malignant disease of the mammary gland, for example, is discussed exhaustively, but other regions of the body receive due consideration and the author is to be congratulated on a balanced review of the whole subject. Dr. Stout takes a sane view of the relation which should obtain between the surgeon and the pathologist, and his estimation of the relative importance that should be assigned to clinical and pathological observations in the diagnosis and treatment of malignant disease is to be commended. He gives a word of caution on the modern doctrine that it is possible to determine the degree of malignancy of any particular tumour from its histology; this does not come amiss. The microscopical diagnosis of the degree of malignancy as formulated by Broders is, he holds, of value provided one has an opportunity to study the tumour in general and not just one portion of it, but he emphasises the danger of placing too great reliance on an incomplete histological examination, a warning which is repeated more than once in the book. With his views on the value of the rapid section prepared at the time of the operation we also concur. Such a section may be of great value, but the difficulties and possible fallacies of this method must not be forgotten. One phrase

is unfortunate. On page 316, in discussing the value of the microscopic diagnosis of malignant disease, Dr. Stout says: "With care and experience, one can separate the malignant from the non-malignant with a considerable degree of accuracy; certainly with far greater accuracy than by any of the serological and other methods of cancer diagnosis." This is surely an understatement of the contribution morbid histologists have made to clinical medicine.

In his preface the author alludes to silver as a diagnostic stain, and the technique of silver staining is described by Dr. George F. Laidlaw in a short appendix. Hardly enough reference to the value of this method is made in the text to indicate in what way this technique is superior to older ones.

The book is well illustrated and to each chapter is attached an adequate bibliography, the references being arranged according to the year of publication. The work will, we think, be appreciated both by the surgeon and the clinical pathologist.

Précis de cancérologie

By G. DUCUING, Professeur à la Faculté de Médecine, Chirurgien-chef des hôpitaux. Paris: Masson et Cie. 1932. Pp. 1259. Fr.140.

THIS book, by the director of the cancer clinic in Toulouse, has been written, as Dr. Ducuing explains in his preface, to enable the medical student to find in one volume a statement of the pathological conceptions of cancer and the clinical facts and observations regarding different tumours. The first 250 pages set out the general pathology of cancer including its experimental investigation, and a chapter on treatment follows. The greater part of this chapter is devoted to a fairly detailed account of the principles and practice of radiotherapy. The remaining 900 pages deal with the study of malignant tumours in the different sites. A brief review of the anatomy of the normal structures precedes each section, and the author then gives an account of the ætiology, morbid anatomy and histology, symptoms, prognosis, complications, clinical forms, diagnosis, and treatment of malignant tumours affecting the region. The book is written in a clear and concise style and is illustrated by instructive diagrams. The information conveyed is sound and reliable, and generally, wherever a point is in dispute, this is clearly indicated. But under the heading Contagion the author discusses the evidence of cancer houses, cancer cages, cancer à deux, and after pointing out the unconvincing nature of such evidence concludes nevertheless that "the problem of the contagious nature of cancer has not been solved." The author may have confused here the terms "contagion" and "infection," but in any case it would be a serious mistake to give the medical student the impression that cancer may in any circumstances be a contagious disease.

The book can be recommended to the medical student and the practitioner.

The Causes of Evolution

By J. B. S. HALDANE, F.R.S. London: Longmans, Green and Co. 1932. Pp. 234. 7*s.* 6*d.*

THESE lectures were given to the University of Wales at Aberystwyth, and their purpose is to rehabilitate, in the light of modern knowledge, the Darwinism which many have supposed to be discredited or even dead. They fall into two parts. In the first Prof. Haldane gives an account of the discontinuous variations *per saltus* which have occupied the geneticist so much since the rediscovery of Mendel's work. He describes the various ways in which unit characters can vary either alone or in combination with one another, and draws attention to the fact that the results may on inspection be indistinguishable from a continuous series. Of all this Darwin knew hardly anything, and what little had come to his notice he deliberately put aside. Such variations, in Prof. Haldane's opinion, give material which is adequate to account for new species if it is sifted by means of natural selection. The second part discusses the operation of natural selection in the light of the mathematical work of R. A. Fisher, S. Wright, and Prof. Haldane himself; here for the first time it is attempted to find out what really happens when one form has this or that degree of advantage over another. The mathematics of the appendix in which the details are given may be unintelligible to many people, but the conclusions which emerge are of great interest and obvious importance. In summary, the book argues, interestingly and open-mindedly, that natural selection is the main cause of evolutionary change, though it will not account for the actual steps by which individuals come to differ from their parents. These are due to other, unknown, causes and hence evolution can follow only certain paths.

Microscopic Slide Precipitation Tests

For the Diagnosis and Exclusion of Syphilis. By B. S. KLINE, A.B., M.D., Chief of Laboratories, Mount Sinai Hospital, Cleveland, Ohio. London: Baillière, Tindall and Cox. 1932. Pp. 99. 13*s.* 6*d.*

THE Kline test is a refinement of the Kahn test. Dr. Kline having originally attempted to overcome the great drawback of this test, which is difficulty in reading, by performing the Kahn test on a slide and reading the results microscopically. Although in 95 per cent. of cases agreement was reached with the clinical condition of the patient, Kline went on to investigate the optimum requirements for antigen preparation, cholesterol, mixing of ingredients, temperature effects, &c. The book contains a good but superficial review of these variations and their effects. The outcome of all this work was the development of the Kline tests for use on heated or unheated serum, cerebro-spinal fluid, or defibrinated blood (which can be taken from the finger). The most important factors in the test are the substitution of the acetone insoluble fraction of alcoholic heart extract (phosphatid) for the ordinary alcoholic ether extract used for other tests, and the use of ringed slides in which the tests are carried out, which allow the results to be read microscopically. The routine test on heated serum is a very simple process which is easy to read, and can be carried out without elaborate apparatus. This, together with the more sensitive method—the exclusion test—should become one of the standard flocculation tests for use in the early sero-diagnosis of syphilis, and as a criterion of complete cure more reliable than the Wassermann reaction.

The book itself is short and is simply written, but the author appears to set himself the task of filling more space than was strictly necessary. This has resulted in some excellently produced full-page photomicrographs showing positive and negative reactions which are quite useful; but it is a pity that the book should have been half filled with puerile pictures illustrating the various stages in the different tests, including repeated drawings of a microscope, test-tubes, centrifuge, and even a collection of animals to indicate when each of these is to be used.

THE LANCET

LONDON: SATURDAY, JANUARY 7, 1933

EFFICIENCY IN MEDICAL PRACTICE

KNOWLEDGE comes but wisdom lingers. In the world at large the outstanding failure of 1932 was a failure to apply the unprecedented power that has come from new knowledge. For the moment what is needed is not so much fresh discoveries—fresh gifts from the gods—as the will and wisdom to apply those we have already. And what is needed by the world at large is needed in most of its constituent activities—including medicine. Speaking of conditions in America Dr. RAY LYMAN WILBUR says: "We now find ourselves with a great mass of usable facts, with a splendid body of trained men and women ready to apply them for the benefit of humanity, but without an administrative or economic system which will give all members of our society an even or an adequate opportunity to profit by them."[1] This country, unlike the United States, has a scheme of national health insurance which does much to keep practitioners in touch with those who require their help and could not otherwise get it. But which of us here is really satisfied with the efficiency of medical service as a whole?

Dr. WILBUR'S remark was made in introducing the report of a committee which has been studying for five years the manifold problems presented in providing an efficient medical service. This committee (see p. 47) was impressed by the failure of medical service both in quantity and quality, and by the wastefulness of private practice as at present conducted in the States. Its majority report says that the solution is group practice for group payment. While the personal relation between patient and practitioner must be preserved—and those who like to do so can pay individual fees as at present—the costs of medical care should be provided through insurance or taxation or both, and the service should be given by groups of physicians, dentists, nurses, pharmacists, and other associated personnel. These groups are to be organised, preferably round a hospital, for rendering "complete home, office, and hospital care." While all the basic public health services are to be extended, it is the duty of every State and local community to see that the local machinery is in smooth running order. To quote Dr. WILBUR again:—

> "The more local we can make the conduct of these medical enterprises . . . the better the results are going to be. Those who know the most about the individual are those near at hand, and, if they can make these decisions, we are almost sure to have them reasonably wise. I fear decisions in this field made too far afield by legislative groups with authority and with funds. But I also fear that that is exactly what will happen if the medical profession fails to go at this job and do it well."[1]

[1] New Eng. Jour. Med., Dec. 15th, 1932, p. 1073.

What the minority of the committee fear, on the other hand, is the exploitation of doctors by business men, and the further removal of the general practitioner from the central place in medical practice. Government care of "the indigent" is, indeed, to be expanded; but only with the ultimate object of relieving the medical profession of this burden. The minority report, which represents the official view of the American Medical Association, thinks that insurance is the shortest road to the commercialisation of medicine. Wherever voluntary insurance is provided by contract with organised groups of doctors there is (it is stated) solicitation of patients, destructive competition among professional groups, inferior medical service, loss of personal relation of patient and physician, and demoralisation of the profession. Having devoted two long leading articles to dismissal of the majority's proposals, the Association's *Journal* (Dec. 10th) says:—

> "There is, moreover, a far greater concern than the rights of the physician to practise as his knowledge and training indicate is desirable. There is the question of Americanism versus sovietism for the American people. There is the question of the right of the American citizen to pick his own doctor and his own hospital, to pay his own bills with his own money, to be responsible to a doctor who is responsible to him."

This would be more convincing if it were true that all Americans are well off. But in the United States, as in England, there are many people, besides the really poor, who avoid medical care because they cannot pay for it. Why is it better that they should insure themselves with an insurance company (which makes a profit) than with a group of doctors?

In industry the proper place of private and public enterprise is to-day in doubt. So it is in medicine, with the additional complication that here there is a third form of undertaking—the charitable. What sort of equilibrium are these three going to reach? Popular political theory now favours formation of semi-independent public trusts, like the B.B.C., and instead of the long-prophesied State medical service we are perhaps to see a National Medical Corporation, under medical management, providing complete medical care for everybody who buys a licence at a post office. Fashions change, however, and for the moment there is no question of choosing an organisation which shall comprehend and unify every form of medical service. Meanwhile the profession is too wise (or disillusioned) to support or condemn particular schemes because they can be given political labels; the test is, do they work? It is hard to foretell the future, but if we cannot see our objective we can at least examine the methods now in use, detect their faults, and decide which of their features must at all costs be preserved. Economic pressure has done much to prevent the expansion of municipal health services, but in certain localities we shall soon have an example of what can be done in providing medical help for every citizen who needs it. Does this plan work? Economic pressure, again, is altering the ideal of our charitable hospitals; they are

turning to systems of contributory insurance for their support, they may even be obliged to pay their visiting medical staffs. Is this the service demanded by our middle classes? How far can the hospitals take up the burden of chronic ill-health which causes so much distress and economic loss to-day? The King's Fund report (noticed on p. 42) rightly concludes that out-patient departments are not fitted to bear this burden—that they should more and more be consultative centres.

If, however, the burden is to be passed back to the general practitioner, his facilities for treatment must be better. The *Journal of the American Medical Association* (Dec. 3rd) says that experience has shown that more than 80 per cent. of all the ailments for which people seek medical aid can be treated most cheaply and most satisfactorily by a family physician with what he can carry in a handbag. This may be true; and like the *J.A.M.A.* we believe that the general practitioner ought to take the central place in medical practice. But we do not believe in family doctors who have no resources, no interests, outside their handbags. We believe that association and coöperation with other practitioners, and preferably with hospitals, will be required for practice in the future. The American scheme of group practice round a hospital, with its reminder of the Dawson report, is one way of achieving this object: the "public medical services" of this country represent another; and a public medical service with hospital and other equipment of its own would approximate to the ideal of Dr. WILBUR'S committee. More humble, but none the less important, was the suggestion for "medical houses" put forward by a correspondent in our columns just a year ago.[2] We have yet to hear that anyone has explored the possibilities of this reasonable proposal; yet it is on such experiments, not on social theorising, that the future of medical practice depends. And without efficient medical practice we shall get little good from medical science.

METABOLISM OF THE CANCER CELL

WHILST there is nothing new in the basic idea of chemical differences between normal and malignant cells, it is only in recent years that the existence of definite abnormality in the metabolism of the cancer cell has received experimental proof through the brilliant researches of OTTO WARBURG. The cancer cell is distinguished above all by its power of rapid and uncontrolled growth. Such growth demands supplies of energy not liberated by hydrolytic reactions or lipase action, so that whilst the study of such processes may yet be of the greatest importance it cannot yield directly the secret of the rapid growth of tumour tissue even in its more limited aspect as a problem in metabolism. If we consider the processes which may yield energy for growth in animal tissues the main source is, of course, the tissue-respiration, and it is therefore at first sight surprising that it is only in very recent years that the oxidative reactions of the cancer cell have received any thorough investigation, though the pioneer experiments of B. R. G. RUSSELL and W. E. GYE were made in 1920. The reason for the apparent neglect is that the study of the respiration and oxidative metabolism of the cancer cell, like many other problems of cell-physiology, has had to await the development of sufficiently refined methods. Now, as H. G. CRABTREE points out in a recent review,[1] the whole subject of the chemical reactions occurring in animal cells and supplying their demands for energy which can be utilised for growth and functional activity, has been made accessible to experimental study. Prof. WARBURG'S work on cancer was a logical development of earlier studies of a purely physiological problem connected with the oxidative changes in the sea-urchin's egg: WARBURG found the respiration of the eggs to be enormously increased when the eggs were fertilised. Rapid development was here accompanied by a great increase in cell-respiration, and the question arose whether this was also true of the cells of rapidly proliferating tumour tissue. Methods of great delicacy were evolved in order to put this idea to experimental test; but it was soon clear that no difference in respiration of anything approaching the same order exists between normal and tumour tissues. In fact the amount of oxygen consumed by the two does not differ at all markedly.

These earlier experiments on the metabolism of the cancer cell, though yielding an enigmatic response as far as the respiration was concerned, led WARBURG directly to the discovery in 1923 of an alternative energy source possessed by malignant tissue—its extraordinary and previously unsuspected power of lactic acid formation. It is this discovery which has been the direct starting point of all recent work on this subject. Cancer cells differ from the great majority of normal tissue cells in their enormous production of lactic acid; an outpouring which persists even when the cells are freely supplied with all the oxygen of which they can make use. Every hour a quantity of lactic acid equal to a tenth of the dry weight of the tumour tissue is produced; in 48 hours therefore a weight of lactic acid approximately equal to the tumour's own fresh-weight may be poured forth from the malignant tissue. The breakdown of carbohydrate into lactic acid is, as is well known, a process in which considerable energy is set free; in muscular contraction, for example, the energy may be used for the production of mechanical work, whilst the lactic acid bacteria are able to grow and multiply anaerobically at the expense of the same chemical reaction. Thus the tumour cell has at its disposal, besides its respiration, an additional source of energy not dependent for its existence on the oxygen supply of the tumour: for short periods, at any rate, the tumour cell can live under strictly anaerobic conditions, as experiments in WARBURG'S laboratory have shown, though in order to enable it to do so the tumour must have an adequate supply

[2] Friel, A. R.: The Out-patient Problem: a Suggested Policy, THE LANCET, 1932, i., 55.

[1] Thirtieth Annual Report of the Imperial Cancer Research Fund, November, 1932.

of sugar for its anaerobic life. Here therefore was a discovery of prime importance, the significance of which is even now not fully realised. So striking is this property of aerobic glycolysis of the cancer cell that it is sometimes forgotten that the respiration is still quantitatively the main source of energy of malignant as of other tissues, accounting on an average for some 70 per cent. of the cells' total energy output. The glycolysis is not to be regarded as an independent entity, unconnected with respiration; and in the last few years attention has been more and more focused on the relationships existing between respiration and lactic acid formation in animal tissues. Nearly all tissues are able to form lactic acid from carbohydrate when their respiration is damaged or suppressed—as, for example, by poisoning with cyanide or by maintaining the tissue in an oxygen-free atmosphere. Embryonic tissues were under these conditions found by WARBURG to give rise to amounts of lactic acid which, in the case of very rapidly growing tissues, may equal those formed by the most active tumours. In tumours therefore the respiration has to a large extent lost the property, which it normally possesses in almost all normal tissues, of suppressing the lactic acid formation. Normal tissues, with a very few exceptions, of which the warm-blooded retina is the most striking example, do not form any appreciable quantity of lactic acid under conditions where care is taken that their respiration shall be uninjured, as in the conditions of WARBURG's experiments. On the other hand, by a partial asphyxia produced by depriving embryonic tissues of oxygen for a time, or by cyanide poisoning, WARBURG was able to show a change of metabolic habit, resulting from the injured respiration, so that in the partially asphyxiated tissue aerobic glycolysis was regularly found, even when the full oxygen supply was restored to the tissue. It is possible that the abnormality of the retina, mentioned above, may be referred to a similar cause on account of the great sensitiveness of this tissue to oxygen deprivation. In any case, it is clear that much more knowledge is urgently needed concerning this damage to respiration in tumour tissue. From measurements of respiratory quotient F. DICKENS and F. SIMER have concluded that it is the oxidation of carbohydrate that is primarily affected in tumour tissue; for whilst they found the respiratory quotient of rapidly growing embryonic mammalian tissues was almost always unity, indicating normal oxidation of carbohydrate, in tumour tissues the respiratory quotient was always less than unity as measured by the specially devised methods of these authors.

As yet attempts of therapeutic application of WARBURG'S discoveries have not yielded any very definite results. The ability of the cancer cell to live without respiration provided that it has adequate carbohydrate, or in a medium of low sugar concentration if it is able to respire, militates against therapeutic attack by deprivation methods. It seems clear that our knowledge of the metabolic aspects of the problem have not as yet been carried far enough to enable us to devise means to restore the metabolism of the cancer cell to normal to be made, except upon empirical lines. This is one of the many problems opened up by Prof. WARBURG'S discoveries.

PSYCHOTHERAPY IN THE CURRICULUM

IF it were possible yet to see in proper perspective the trend of medical progress during the year now ended, it seems likely that the penetration of psychological views into general medicine would stand out as its most salient feature. For long this penetration was so slow as to be almost unrecognised, but the acceleration of a change of outlook, which is not confined to this country, has recently been so notable as to betoken the opening of an important phase in medical history. Dr. GILLESPIE, in a lecture on psychotherapy and general practice which is printed on another page, suggests that since the development of scientific ideals medicine has shown a bias in favour of physical ætiology for every disorder and a persistent disregard of psychological aspects. Some results of this bias are manifest in the case-histories he records. Dr. W. LANGDON BROWN, in his inaugural lecture as Regius professor in Cambridge,[1] rejoices that in these latter days medicine is becoming increasingly psychological in its approach to disease, while not neglecting the development of its scientific armamentarium. His personal conviction, gained "by sheer force of experience," of the need for a more scientific approach to medicine was forcibly stated in his address at the recent opening of the new home of the Institute of Medical Psychology (see p. 64). No one is likely nowadays to doubt the truth of his contention that quite as many people are ill because they are unhappy as are unhappy because they are ill. Many general practitioners, who not so long ago were sure of their competence to deal with most of the cases presented to them, are now becoming conscious of the large proportion of their patients who really require mental rather than physical alteratives, and are dissatisfied with their equipment to cope with them. This dissatisfaction was voiced recently at an old students' dinner when the plea for help from the teaching schools received unexpectedly wide support.

The almost complete omission of the subject of psychotherapy from our medical curriculum, has a bearing on the dispute now raging (see p. 54) whether or not a practitioner is entitled to claim a fee for such treatment in respect of his panel patients. The opposition to its inclusion can only be understood when the attitude is viewed in historical perspective. Towards the end of the last century the experiments of Charcot and the more productive efforts of Janet had prepared the way for Freud, whose work offered at least a pathology of those psychoneurotic conditions which, in some guise or other, had always been a puzzle to medicine. Attention was being attracted to this work when the Great War broke out. Then came the shell-shock episode and, in accordance with the mental attitude of the time, there was built up a phantastic

[1] Cambridge University Press. 1932. Pp. 52. 2s.

pathology, and we decorated hysterical subjects with wound-stripes as a sign of having received physical injury at the hands of the enemy. When the loss of man power attributed to shell-shock forced a recognition of the psychological nature of disorders of this category, qualified medical men were encouraged to take up the study of psychopathology in order to treat the abundant material that cumbered our military hospitals. Then the new theories were, in some form or other, found indispensable to the understanding and treatment of the condition, and the young men thus initiated into the subject became a leaven that encouraged the change of attitude alluded to above. The clash of principles manifest at this time was, however, but a repetition of ancient controversy. Vitalists and mechanists, under various names, have supported their opposing principles throughout the centuries; to the *physis* of Hippocrates, the *anima* of Stahl, the *blas* of Van Helmont, were opposed the atoms of Asclepiades and the ethereal fluid of Hoffmann, and now we may choose between the libido of the psycho-analysts and the glandular predominances of Berman, or build up out of conditioned reflexes a psychology without a psyche. In the eighteenth century arose a pseudo-physiological terminology that has just received a blow from the request, in the Official Nomenclature of Diseases, that the word "neurasthenia" should be avoided. Aided by this terminology, and encouraged by wonderful advances in a material science that counted teleology as heresy, we have regarded animism in any form as dead. If the medical student heard it mentioned it was as an obstructive theory finally overthrown by the synthesis of urea. For him the test-tube and microscope were ultimate authorities, and if a "nervous" disorder had to be labelled "functional" that was only because our methods had not quite reached the perfection that would enable us to understand its mechanism. This fundamental assumption is responsible for the irrelevant pathology that has led to so much mishandling of the psychoneurotic patient. It is the same assumption against which Stahl, a sound clinician, fought in the seventeenth century, when he protested that the anatomy and physiology of his day were given a greater load than they could carry. Unfortunately he departed from a safe agnosticism and propounded a sterile theory of animism which is remembered to his disadvantage, whilst the lesson he sought to teach has been forgotten. Now at last, however, psychopathology is presented to us as a body of observation and theory, adaptable to clinical use and capable of some degree of systematisation, whose advocates find in it nothing contrary to physiological principles. Objections have been made that the newer conception deals with what cannot be weighed or measured, that it departs from the basic principles of cause and effect by introducing the conception of aim, and is therefore unworthy to be granted validity as a science; but this expresses the attitude rather of nineteenth century science than the position in which we stand to-day. The practical psychotherapist tends to ignore such objections, while a study of their origin would enable him to meet them effectively.

The rapid changes now taking place have thus a deep historical significance. Apart from special establishments like the Institute of Medical Psychology which has developed from modest beginnings as the Tavistock Clinic, and organises well-attended courses for practitioners, there are several out-patient departments at general and neurological hospitals, and at some teaching hospitals lectures are given on the psychoneuroses in addition to the old-established tuition in psychiatry. But whether the clinical material present in every department is used for demonstration or whether it is ignored, or even unrecognised, depends upon the personality of the physician or surgeon in charge of the department. There are two main obstacles to the development of special teaching: first, the lack of examination value, for no question on the subject is as yet expected at any qualifying examination; secondly, perhaps a relic of the bias against psycho-analysis, the impression that an interest in this subject is at best morbid and at worst indecent. On the other hand, the growing demand from both practitioners and students for instruction in psychopathology and psychotherapeutics is not likely to be ignored by the committee now considering the curriculum. Any official recognition given to psychotherapy, whatever its extent, should have beneficial results far beyond its immediate outcome, for a new orientation on the part of clinical teachers is at least as important as the organisation of specific instruction.

THE SEX HORMONES

IN many branches of medical research knowledge is developing so rapidly that the practitioner must rely upon well-informed reviews in order to keep up to date. Particularly does this apply to the mechanism of the internal secretions, and most of all to those connected with the regulation of the sexual cycle. Any person attempting to keep up with the world literature on this subject would have to devote his full time to reading, and even then it is doubtful if he would succeed in sorting out the wheat from the chaff, when the chaff can so readily be mistaken for wheat. What experienced worker would have believed a few years ago that pregnancy could be diagnosed accurately within the first few weeks of gestation by injecting the patient's urine into immature mice, and later inspecting their entrails in the augural manner? Recent development in this subject is well outlined in the article by Prof. Walther Schoeller, which appears later in this issue. He emphasises the great importance of a possible relationship between plant and animal hormones, and to many medical readers it may come as a surprise to learn that plants have hormones. The review indicates the complexity of the subject, and the large number of experimenters at present engaged on the problem. The major part of the pioneer work comes from Germany and America, but important observations have been made in this country without which progress might have stayed. Thus the chemical work of Marrian, referred to by Prof. Schoeller, has proved to be of much significance, and the chemical and physiological studies of Dodds, Parkes, and their co-workers have been another essential link in the chain.

ANNOTATIONS

THE NEW YEAR HONOURS

THE list of honours issued on Jan. 1st contains but a small number of medical men, and is mainly composed, according to what is becoming a regular plan, of those who obtain recognition or advancement in the various Services, militant and civil. Medicine, however, welcomes a new peer, and Sir Thomas Horder will be acclaimed by his fellow-practitioners as a worthy recipient of the high honour. Alike as a great clinical physician, and as a vigorous and acute worker in fields of wide social interest, Sir Thomas has the personality needed for effective membership of the Upper House, and the well-merited distinction will surely receive further justification. Four members of the medical profession receive knighthoods, among them being Major-General Dick Megaw, the Director-General, I.M.S., and Dr. F. J. Willans, surgeon apothecary to H.M. Household at Sandringham. Dr. Charlotte Purnell, who is created O.B.E., is the devoted medical missionary, who has worked for 20 years in Palestine, and is now in charge of the Mission Station in Amman. We note with pleasure the knighthood awarded to Prof. F. T. G. Hobday, the Principal of the Royal Veterinary College, in the interests of which he has worked long and untiringly; and many will appreciate, as we do, how well deserved was the same honour by Principal R. S. Rait, Vice-Chancellor of Glasgow University. Our readers will also approve highly of the bestowal of the C.B.E. on Mrs. Alice Baker, a founder of the Medical Research Institute, Melbourne; Mr. Reginald Blunt, for half a century associated with the Cheyne Hospital for Children; Mr. Peter Evans, an energetic worker in the cause of the blind; and Prof. F. H. A. Marshall, director of the Institute of Animal Nutrition at Cambridge and an authority on sexual physiology. A detailed list of recipients is published on another page, to all of whom we offer congratulations on the public acknowledgment of their merits.

RECTAL OR VAGINAL EXAMINATION IN LABOUR

THE examination of patients by the rectum during labour was recommended by Reis and Kronig in 1893, in the hope that the avoidance of vaginal examination might diminish the incidence of puerperal sepsis. The method has been widely used but has not met with general approval, and it is doubtful whether it has any advantage other than saving the trouble of washing the hands. H. W. Mayes has analysed [1] the results of rectal and vaginal examinations in 3884 cases at the Methodist Episcopal Hospital in Brooklyn. He found that the morbidity-rate among those patients who were examined per vaginam was about 1 per cent. higher than the morbidity-rate of those who were examined only per rectum. In 1947 cases examined by the rectum alone the morbidity-rate was 5·08 per cent. Rectal examination therefore does not abolish the danger of puerperal infection, and the higher rate following vaginal examination is accounted for by the fact that the parturient woman was examined by this route in all cases of difficult or prolonged labour. Of several objections to the routine adoption of rectal examination the most important is its inaccuracy. Dr. Mayes states that a 10 per cent. error is generally admitted for those with experience, and he suggests that the prevailing high stillbirth-rate may be due in part to the fact that abnormal conditions are not recognised in time by rectal examination. The student in fact finds it hard enough to make a diagnosis by vaginal examination and would, one fears, learn nothing if he were to examine his quota of 20 cases by the rectum instead. Before a man is sure of his rectal findings, Dr. Mayes remarks, he must follow at least 100 patients through labour. It should also be borne in mind that the posterior vaginal wall which is forced into the cervix during rectal examination cannot be considered much more sterile than the examiner's finger. Moreover, the rectal mucous membrane may be injured and pathogenic organisms escape into the tissues of the recto-vaginal septum. When the finger is withdrawn the perineum is left contaminated. The question is bound up with that of vaginal antisepsis which is not yet settled. In this country bacteriologists tell us that it is impossible to sterilise the vaginal wall, and most obstetricians think that the introduction of antiseptics into the vagina gives no better results than the customary swabbing of the vulva. Dr. Mayes advises the injection of mercurochrome, and thinks that by its means it is possible to sterilise the vagina. To one holding this view vaginal examination becomes a safe procedure, and he therefore recommends the abandonment of rectal examination during labour.

[1] Surg., Gyn., and Obst., December, 1932, p. 771.

"THE SOCIAL PROBLEM GROUP"

AT the conference of the Central Association for Mental Welfare held last month in London, Mr. E. J. Lidbetter read a paper upon the Value of Family Histories in the Study of the Inheritance of Mental Defect. For the last 25 years he has been conducting an inquiry into the relation between heredity and social inadequacy in an East London area, his procedure having been to prepare elaborate family pedigrees of persons admitted into the poor-law institution of that area. This investigation has now attained comprehensive proportions, and he was able to show the meeting a few of his charted pedigrees. The following are among the chief conclusions reached: that a conspicuously large number of mentally defective children are born in families containing a record of certifiable insanity; that the families studied have a much larger fertility-rate and, as a result of the improvement of their conditions in recent years, a larger survival-rate than any other social element in the community; and that the principle of assortative mating clearly holds in the families he has studied. This last observation Mr. Lidbetter regards as eugenically encouraging. His evidence suggests that families containing defective, "sub-cultural," and mentally backward persons which, in aggregate, have been referred to by the Wood Committee as comprising the social problem group, are closely intermingled and overlap; and that they preserve their characteristics from generation to generation, and probably do not often, by intermarriage, vitiate good stocks or derive survival strength from out-breeding with such stocks.

Mr. Lidbetter's inquiries, conducted over a long period of years in a restricted urban area, confirm the findings of the much more comprehensive though less intensive survey conducted by Dr. E. O. Lewis and described in the Wood report. These findings raise biological problems of the first importance. To what extent are the various manifestations of

social inadequacy evinced by the social problem group the product, on the one hand, of inborn and hereditary factors, or on the other, of such extrinsic influences as are constituted by the insanitary environment of a slum district, the bad family tradition, and subversive parental example which too often exist among them? The remedies adopted by social reformers will clearly depend on the answer to this question. In concluding his address, Mr. Lidbetter stressed the need of a comprehensive and impartial investigation, carried out under proper authority and by competent persons, and planned so as to supplement such local investigations as those now being carried out by Mr. Caradog Jones, of the department of social science at Liverpool University, and the Eugenics Society. The latter has devised a questionnaire which has the object of reversing the procedure followed by Dr. Lewis. The latter, starting from a specific investigation into mental defectiveness, was led to recognise the importance of a social problem group, largely composed of subnormal though not certifiably defective persons, who are the main procreators of mental defectiveness. The inquiry of the Eugenics Society, starting from a special manifestation of social inadequacy—in this case the continuous receipt of poor-law relief for two years or longer—seeks to ascertain whether the incidence of mental defectives in such families is higher than the average familial incidence obtaining in the community at large. It will be difficult to imagine an investigation of greater social importance than that proposed by Mr. Lidbetter. If the conception of a "social problem group" is justified, and if it has the characteristics which have been described, it is clearly a matter of national urgency that the fertility of its constituent members be limited by any reasonable methods that do not involve compulsion or injustice. In view of the high fertility-rate which all observers have noted as characterising the group, it would appear that if measures designed with this end are not soon adopted, seeds may be sown which, several generations hence, will germinate with disastrous social consequences.

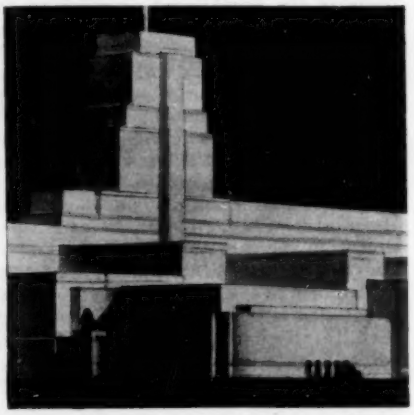
THE LIVER IN ECLAMPSIA

DEGENERATION of liver cells is present in all or nearly all fatal cases of eclampsia, though only about half of them show the fibrino-hæmorrhagic necroses which are characteristic of the disease in the sense that they are never seen in its absence. But how the liver changes are produced has never been satisfactorily determined, despite a great deal of investigation, mostly along biochemical lines. Dr. G. W. Theobald,[1] working at University College, now produces an attractively simple mechanical explanation. He thinks that the lesions are due to increased intra-abdominal pressure—i.e., that they are the result rather than the cause of the convulsions. He supports his thesis with some striking experiments on dogs and cats. The animal has its belly tightened up somewhat by the injection of about a litre of bland liquid into the peritoneal cavity. Binders are then placed round the abdomen and drawn tight, by which manœuvre the intra-abdominal pressure is raised to 80–100 cm. of salt solution. Maintained for two minutes, this constitutes an imitation "fit." By this means, severe and extensive necrosis of liver is produced in nearly all animals, and as the liver is sensitive to changes in its blood-supply and autolyses quickly, quite obvious alterations, naked eye and microscopical, are found after 24 or 48 hours. The precise details of the necrosis varied a good deal in different cases; the damage was sometimes central, while in others it had no particular lobular distribution; extensive fatty change might be present or absent; and in one animal considerable portal thrombosis was found. The destruction was in some instances enough to cause death; a pregnant cat had five half-minute "fits," and was killed moribund 18 hours later. Other abdominal organs were not affected, though small hæmorrhages were sometimes found in the lungs and brain. Dr. Theobald draws the obvious conclusion that it is of the greatest importance to prevent the onset or limit the number of eclamptic convulsions.

[1] Jour. Path. and Bact., 1932, xxxv., 843.

LONDON'S UNIVERSITY CENTRE

ON Dec. 29th the first excavations were made on the site of the new University of London buildings to the north of the British Museum. The history of this great project has already been outlined in our columns [1] and we printed more recently [2] a reproduction of one aspect of Mr. Charles Holden's model. Four large holes have now been cut at points which mark the corners of the proposed Senate House and administrative block. The object of this survey is to discover the character of the subsoil; the southern part of the site will be excavated at once, and the formal laying of the foundation-stone is planned for the early summer. The new centre will cover 10½ acres and be bounded, roughly, by Russell-square and Montague-street on the east, Malet-street on the west, Byng-place on the north, and the British Museum on the south; its main part includes what was Torrington-square. The main group of buildings is to occupy the centre, and open spaces roughly equal to those which at present exist are to be left along the east and west frontages. The arrangement will greatly reduce traffic noise and vibration and allow generous parking accommodation for cars near each department. The Woburn-square frontage will be occupied by a private garden with a covered walk. As Mr. Holden points out, this type of plan offers great possibilities for a composition of the masses into one great whole which will be impressive even while still incomplete. The group will be dominated by a tower, and the whole centre will be so placed as to appear with quiet insistence from each of the main arteries in the neighbourhood—Tottenham Court-road, Gower-street, Malet-street, and Southampton-row. The composition of the buildings will be seen to its best advantage from Russell-square. Mr. Holden's object has been to express the plan naturally



[1] THE LANCET, 1931, i., 1303. [2] Ibid., 1932, ii., 32.

in a modern design. The orderly disposition of the parts and the strong horizontal character of the whole should present a neighbourly front to the British Museum and the surrounding buildings without the necessity of introducing a columnar treatment. A complete film record of the building is being made.

The scheme will take some years to complete, but should be nearly finished when the University celebrates its centenary at the end of 1936. The Senate House should be ready in 1934. The cost of the site has been met mostly from private benefaction, and important contributions towards the expense of the buildings have been made by the London County Council, Mr. Samuel Courtauld, the Worshipful Company of Goldsmiths, and the Czechoslovakian Government, which has generously promised a sum for the building and equipment of the School of Slavonic Studies.

The new centre will mark a great change for the better in the conditions under which the University does its work. The portion of the Imperial Institute at its disposal is used from cellar to attic and the corridors are filled with makeshift structures, so that the daily work is handicapped by the utmost difficulty and discomfort. For its Great Hall the University has only a huge wooden shed, decorated on festive occasions with yellow and white muslin; and the library, including the Goldsmiths' collection of economic literature and the Durning-Lawrence Library, has long overflowed into passages and rooms continually used for other purposes. If the University is to impress itself upon London and Londoners, it must have a worthy and dignified home. On the new site there will be ample room for the administrative work and for the many bodies which meet daily; the Goldsmiths' munificence will ensure worthy housing of the library; the Institute of Historical Research will be moved from the temporary building in which, in the course of a few years, it has achieved a great reputation, and the Courtauld Institute of Art and the Schools of Oriental and Slavonic Studies will also be housed at the centre. Birkbeck College and the London Day Training College—renamed the Institute of Education—will be transferred, together with the headquarters of the Officers' Training Corps and the Students' Union. The brochure recently issued by the University includes a map showing how well situated the centre will be in relation to the majority of the constituent colleges.

"HOMEOSTASIS"

As man en masse progresses through his pilgrimage he marks his progress by making himself more and more independent of his environment. His cells and tissues have done the same; in birds and mammals they have secured a habitat for themselves of a steady composition and temperature, and have developed a whole series of ingenious and complicated reactions whose effect, and perhaps whose object, is to maintain the remarkable uniformity of the internal environment to which the special mark at 98·4° F. on the clinical thermometer is a characteristic witness. Why it has been worth while to develop cells which will work only under a very limited range of conditions is not altogether clear; an animal which must have its blood-sugar somewhere between about 50 and 150 mg. per 100 c.cm., the reaction of its blood between pH 7·0 and 7·6, and its temperature between 95° and 105° F. would seem to have given hostages to fortune. But so it is, and we can only suppose that the body does its best work in such surroundings. And without thinking too much of the reasons for it, we can with much profit study the "wisdom," as the late Prof. E. H. Starling put it, of the body and its cleverness in making the necessary adjustments to enable its tissues to have the freedom which they gain by escaping from the slavery of their surroundings. The idea dates at least from Claude Bernard, and round it Prof. Cannon has now written an essay [1] which we have no hesitation in commending to all who have any interest in the working of the body—physiologists, pathologists, medical men, and biologists in general. He discusses the regulation—"homeostasis" as he calls it—of the fluids of the body, hunger and thirst, reaction, temperature, oxygen supply, the water, sugar, and proteins of the blood, and especially the rôle of the sympathetic-adrenal mechanism which his own investigations have done so much to elucidate. He deals with the physiology of the body as a whole, not the working of organs, and what he says is obviously of importance as much in the ups and downs of normal life and in disease as in the theory of evolution. We can wish that someone brought up on the other side of the invisible boundary between physiology and pathology would write also of his discipline from the same point of view.

DIPHTHERIA CONTROL IN SOUTH AUSTRALIA

In South Australia, Dr. A. R. Southwood [2] points out, the population is almost equally divided between the metropolitan area and the rural districts, and except when diphtheria is very prevalent, as it was in 1921, the incidence is far higher in town than country. In 1921 the metropolitan cases were but slightly more numerous; after that there was a steep fall in incidence among both sections of the population—especially the rural. This decline was maintained until 1931, when some increase took place, particularly in the metropolitan area. Southwood emphasises the great irregularity in the incidence of diphtheria from year to year, and insists that in any estimate of the effects of preventive measures the statistics over at least 10 or 12 years must be reviewed. It seems that in South Australia active immunisation, on any notable scale at least, was only begun in two of the larger towns of the State in June, 1932; hence, no part of this drop in incidence can be ascribed to it. He admits the value and lack of danger of active immunisation carried out with formol-toxoid (anatoxin), but observes that methods of control applicable to densely populated cities may not be altogether suitable to the sparse populations of the country districts of Australia. The medical officer in face of an outbreak in such a district must be guided by circumstances as to which weapon he is to employ. Amongst these, Southwood urges, none is more potent than early clinical recognition of the disease followed by prompt segregation of the sufferer. Such a step may avert an epidemic. But, epidemic prevalence once established, "a large number of atypical cases occur, and many unsuspected carriers are always at large." During epidemic prevalence, as in the control of endemic infectious disease, the isolation hospital, it is now generally allowed, is of no great value as part of the machinery of prevention. Swift recognition and removal of the *first* cases alone enable these institutions to play their original part with success. Southwood says that the public must

[1] The Wisdom of the Body. By W. B. Cannon, M.D., Sc.D., LL.D., Professor of Physiology in Harvard Medical School. London: Kegan Paul, Trench, Trübner and Co. 1932. Pp. 312. With 41 figures. 12*s.* 6*d.*

[2] Med. Jour. Australia, Oct. 29th, p. 535.

be impressed with its duties; a child complaining of sore-throat must be kept apart until diphtheria can be excluded by the physician. Immediate contacts should be swabbed. He quotes with approval the scheme for the control of outbreaks of diphtheria in residential institutions worked out by C. C. Okell, A. J. Eagleton, and R. A. O'Brien [3] which, based upon the Schick test, swabbings and virulence tests, permits of rapid handling of the situation.

Warned perhaps by the increased number of cases which occurred in the State in 1931, after a lull of ten years, Southwood fears that storm may follow calm. Although he thinks that in an inter-epidemic period immunisation may not be necessary, yet, when the disease begins to spread rapidly, it would be wise to protect susceptible children by anatoxin. Effort should be concentrated upon children between 1 and 5 years of age for whom, he thinks, a preliminary Schick test is unnecessary "since most of them are susceptible and it is safe to immunise them all." There can be no two opinions, among those competent to judge, as to the value and safety of immunisation, but whether or not a preliminary Schick test should to be performed among those of pre-school age is still a subject for debate. Amongst unsalted rural or semi-rural populations the proportion of positive reactors in children of pre-school age is likely to be high, and the omission of a preliminary Schick test may be dictated by this consideration no less than by expediency. In the case of children of pre-school age living in a crowded industrial city, the proportion of immunes may be notably high, and here the omission or otherwise of a preliminary Schick test may have to be decided by expediency alone. The necessity for simplifying the scheme and reducing the number of attendances at the clinic to a minimum may be considered of more importance than the "immunisation" of some children who are already immune.

Expediency also may be the governing factor in determining whether immunisation should be carried out during epidemic prevalence. As Southwood points out, "when people find the illness actively in their midst they are most likely to heed the advice to have their children immunised." The negative corollary of this attitude applies, unfortunately, not only to diphtheria, but to small-pox also.

ON THE TESTING OF HEARING

IT is a difficult matter to find a standard by which to measure and record the acuity of hearing and the ratio of the perception of sound by air and bone conduction. A special committee was therefore appointed in January, 1929, by the section of otology of the Royal Society of Medicine to consider various tests of hearing, and this committee has now issued its report.[4] The greater part of its labours has been directed to the use of tuning-forks, as the only efficient method at present known of estimating bone conduction, and these are also recommended for use as the principal method of testing the hearing acuity for air-borne sound. The committee finds that audiometers, as at present manufactured, are scientifically accurate oscillometers, but fail in their application to clinical otology for a variety of reasons. If they are fitted with telephone receivers, these exert different degrees of pressure on the ears, may displace the tragus, allow leakage of sound, or cause error through conduction by the cartilage; on the other hand, if audiometers are used with a loud-speaker in an ordinary room, errors result from reflection of sound-waves. This conclusion does not dispute the use of the audiometer for the detection of deafness in school-children, for which purpose it has been widely adopted, with official sanction [5]; it is a valuable instrument for such preliminary testing, although not sufficiently accurate for consulting-room work.

The committee recommended that the result obtained by testing air and bone conduction by means of tuning-forks should be plotted on a graph; but we hope that the type of audiograph suggested may later be improved and simplified, for it is not easy to understand in its present form. It has been customary to test the degree of deafness by measuring the time that the fork is audible to the normal observer after it has ceased to be heard by the deaf patient, and this is the method recommended; but the committee was faced from the outset by the difficulty that the rate of decay of the vibrations varies enormously with different forks; this rate is estimated by the "half-intensity period" of the fork—that is, by the number of seconds required for the amplitude of vibration to fade by one-half. This period should be between three and ten seconds. In collaboration with the National Physical Laboratory and with the manufacturers, standard forks have been produced, and will shortly be placed on the market; on each fork are engraved its half-intensity period when suspended in air, and when its base is applied to the mastoid, and the relative intensity of the sound transmitted by the prongs and by the base, which is termed the "characteristic" of the fork. When the results of tests with such forks are expressed in half-intensity units, instead of in seconds, the figures so obtained are strictly comparable, though made by different observers and with different forks. This represents a definite scientific advance in the accuracy of testing and recording degrees of deafness, and British otology may well be proud of having given a lead to the world on this difficult subject. The report is amplified by appendices on estimation of the high tone limit, on auditory fatigue, on the use of tuning-forks, on the physics involved, and on audiography; it is carefully written, reflects great credit on the committee, and deserves the attention of all otologists.

[3] THE LANCET, 1924, i., 800.
[4] Longmans, Green and Co. 1932. Pp. 33. 2s. 6d.
[5] See THE LANCET, 1932, ii., 1347.

PNEUMONIA IN THE STEEL INDUSTRY

THE Occupational Mortality Supplement, 1921–23, of the Registrar-General for England and Wales shows that among occupations with an excessive death-rate from pneumonia various groups of workers in the iron and steel industry occupy a conspicuous place. For instance, the comparative mortality figure of puddlers from pneumonia is exceeded by only six out of the 178 occupation groups. The work involved is mainly heavy (and thus a good physical type of recruit is no doubt required) and it involves considerable and probably trying changes of temperature. Some further evidence of this occupational risk was provided in one of the earliest reports of the Industrial Health Research Board,[6] in which Dr. H. M. Vernon included an analysis of the sickness records of about 20,000 steel workers. He found some excess of lost time amongst the men frequently working at high temperatures, but his figures did not permit any fine analysis of cause or

[6] Industrial Health Research Board. Report No. 5. Fatigue and Efficiency in the Iron and Steel Industry. H.M. Stationery Office, 1920.

causation. A further study has recently been made, for the United States Public Health Service, by Dean K. Brundage and J. J. Bloomfield,[7] and an attempt made to isolate the factors responsible for the high incidence of pneumonia again found. Factors apart from working conditions, such as seasonal variation in the frequency of pneumonia, influenza epidemics, economic status of the workers, their age, nationality, extent of addiction to alcoholic stimulants, and prevalence of the disease in the general community were all considered and found to be of insufficient influence. A calculation of the frequency of pneumonia according to the nature of exposure shows very high rates amongst the men obliged to work out of doors during inclement weather (13·6 per 1000) and for those subjected to heat with wide changes in temperature without significant exposure to any other kind of industrial health hazard (12·6 per 1000), in contrast with a rate of 3·9 cases annually per 1000 exposed to none of the working conditions held to be hazardous. Sudden cooling or chilling of the body the authors believe to be an important predisposing factor, and the importance of its avoidance should be stressed amongst the men, for whom change-houses should be adequately provided. Some of the occupational groups here dealt with are too small to be of real service, but the report represents a careful attempt to reach statistically sound conclusions, though in investigations of industrial hazards it is notoriously difficult to be certain that all extraneous factors have been effectively isolated. This report, however, is but a preliminary, for the full study is to be presented in Public Health Bulletin No. 202, which is still in the press.

ANIMALS AS A RESPONSIBILITY

OUR responsibility towards animals is recognised by all, and the State has legislated widely on their behalf. In his Alexander Pedler lecture [8] for 1932, Sir Frederick Hobday, principal of the Royal Veterinary College, showed the reverse of the shield; we are not, he said, equally alive to the responsibilities towards ourselves which this contact with animals imposes, and we are insufficiently protected against the dangers it creates. Glanders and rabies have been eradicated in this country and are not likely to recur so long as the present preventive legislation is obeyed. He holds also that the timely application of the right methods has done much to stamp out foot-and-mouth disease and anthrax. But the figures he gave for bovine tuberculosis, though familiar, remain remarkable. The average proportion of tuberculous cattle in the dairy herds of Great Britain works out, he believes, at between 30 per cent. and 40 per cent., and in some cases is as much as 60 per cent.; in all there are probably over a million infected cattle. Prof. Hobday quoted figures showing that not only do between 3000 and 4000 children under 5 years die of tuberculosis caught from the cow, but some 45,000 people suffer annually from joint affections the results of bovine tuberculosis with which they have been infected early in life. The consumption of meat also entails danger if, as in England, the animals can be slaughtered at private abattoirs which are often quite unsuitable. The rest of Europe is far ahead of us in this respect, for only in England are animals killed for food which have not been inspected by qualified veterinary surgeons. This country has, as he says, been far behind foreign countries in the governmental support of veterinary research, and Prof. Hobday's lecture lends force to his appeal for donations for the rebuilding and endowment of the Royal Veterinary College.

[7] Jour. Indust. Hyg., December, 1932, p. 345.

[8] Animals as a National Responsibility. The Alexander Pedler lecture of the British Science Guild, delivered under the auspices of the Burton-on-Trent Natural History and Archæological Society, by Prof. F. T. G. Hobday, F.R.C.V.S. Obtainable from the Guild, 6, John-street, Adelphi, London, W.C.2, at 1s.

ZOSTER VIRUS AND BELL'S PALSY

IT is now some 26 years since Ramsay Hunt put forward the view that certain cases of facial paralysis —those associated with a vesicular eruption in the sensory area of the seventh nerve—were due to the zoster virus. And although this syndrome has been recognised and generally accepted, experimental evidence in support of it has been lacking. Elsewhere in this issue, Dr. R. S. Aitken and Dr. R. T. Brain show that cases of the Ramsay Hunt syndrome possess specific zoster antibody in their blood; Hunt's thesis appears to have been correct. But apart from the interest attaching to this demonstration that a proportion of cases of facial paralysis are due to the zoster virus, Aitken and Brain's work has another significance. Quite a number of the filtrable viruses are only capable of attacking a limited number of animal species. Sometimes one species alone is susceptible and this seems to be so with the virus of zoster. Where man is the susceptible species the direct method of experimentation is often precluded, and one has to fall back on indirect means—histological, morphological, and immunological—to provide a solution to our problems. The studies of Netter and his colleagues demonstrating the unity of the clinical group of zoster and the relationship of the zoster and varicella viruses is a good example in point; the work of Aitken and Brain is another.

BROMPTON HOSPITAL REPORTS

WE welcome the appearance of the first number of this new publication, which contains a collection of papers written by members of the honorary staff of the Brompton Hospital for Consumption and Diseases of the Chest and by others working in its various departments. In these days when medical journals, dealing with every ramification of our science, have multiplied to so great an extent that it is difficult for any investigator to keep abreast with all the materials necessary for his work, it is convenient to have a series of papers dealing with a particular branch of medicine brought together into a single volume. The articles here republished indicate that the research department of the hospital is doing useful work. The incidence of tuberculosis upon children has been especially studied, but there emerges, as what may be called a by-product of the investigation by radiological methods, that there are many instances of alterations in the structure of the lungs in children, visible by X rays, which are not due to the tubercle bacillus, and a paper by Dr. F. H. Young deals with the problem of these conditions from a clinical point of view. It would seem that sanocrysin, though far from fulfilling the hopes held out at its introduction, has yet established itself as a useful adjuvant in the treatment of tuberculosis, and a contribution to our knowledge of its mode of action is here made by Dr. E. E. Atkin, who studied its anti-allergic effects in animals inoculated with dead cultures of tubercle bacilli and found a definite inhibition of the formation of tubercles. We hope that future numbers of these reports may be furnished with an alphabetical index to facilitate reference.

SPECIAL ARTICLES

NEW WORK ON HORMONES*

By Prof. W. Schoeller

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During the last few decades research workers have been endeavouring to find out how far the regulation of the female sexual cycle is dependent upon the influence of hormones. It can now be taken as definitely proved that the ripening follicle produces a hormone, or rather a group of closely related chemical compounds, to which we give the name of follicular hormone. The chief function of this hormone is to stimulate the development of the secondary sex organs of the female, such as the uterus, vagina, and mammæ. When the follicle becomes modified to form a corpus luteum the latter generates another hormone which was obtained in concentrated form by Corner [1] in 1929, and the main purpose of which is to stimulate the uterus, which has proliferated under the influence of the follicular hormone, to prepare a decidua suitable for the nidation of an ovum.

These processes occurring in the mature ovary have been shown by Evans [2] to be dependent upon the secretory activity of the anterior lobe of the pituitary body. We are indebted to Aschheim and Zondek [3] for showing that a substance is found in the urine of pregnant warm-blooded animals which is either identical or closely related chemically with the gonadotropic hormone of the pituitary.

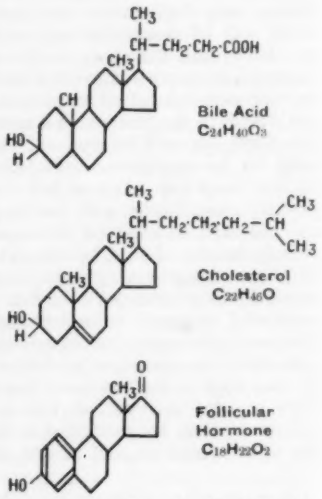
The discovery of the follicular hormone was made possible by the test method elaborated by Allen and Doisy.[4] This method depends upon the cyclical changes occurring in the vaginal secretion of rodents which were observed (1917) by Stockard and Papanicolaou [5] and later (1922) by Long and Evans.[6] By the administration of follicular hormone to castrated female mice and rats it is possible to produce an artificial œstral cycle and during the height of œstrus non-nucleated, horny epithelial cells appear in the vaginal secretions. The occurrence of these is used to standardise the hormone in terms of rat or mouse units. In the normal mature woman only some 100 mouse units of follicular hormone are demonstrable in each litre of urine, but during the later months of pregnancy up to 10,000 units per litre are excreted. The urine of mares in late pregnancy may contain 100,000 or more units per litre.[7]

THE FOLLICULAR HORMONE

The abundant supply of follicular hormone thus available has greatly facilitated its isolation and has made it possible for organic chemists to get busy at clearing up the chemical constitution of this important hormone. First came the classical researches of Butenandt (Göttingen) along with those of Doisy (St. Louis) and Marrian (London). In 1929 Doisy and Butenandt, working independently, were able to prepare the hormone in pure crystalline form. According to Butenandt,[8] the hormone has the formula $C_{18}H_{22}O_2$ and is a partially hydrated phenanthren derivative, one of the oxyketones. The phenanthren ring appears to be joined to a pentagonal ring system. Its constitution thus seems to be very similar to that recently demonstrated for the sterols and biliary acids.

The follicular hormone occurs in several isomeric forms, which differ in their activity. α-follicular hormone has, according to Butenandt,[8] an activity of 10-million mouse units per gramme, while the β form contains only 1½ million units. A third highly active isomer was recently described by Schwenk and Hildebrandt.[9] Marrian [10] was able to isolate a compound closely related to the hormone but containing more oxygen, the so-called follicular hormone hydroxide with the formula $C_{18}H_{24}O_3$, which Butenandt [8] was able to reconvert into the α and β forms of the hormone by splitting off water. In the hydroxide the three oxygen atoms are present as hydroxyl groups, one of which has the characteristics of a phenol. The substance has an activity of only 75,000 mouse units per gramme. Recently Girard and his co-workers [11] have reported upon two further isomers closely related to the follicular hormone, equilin and hippulin, which they extracted from mare's urine. Further, Laqueur [12] and Marrian [13] were also able to isolate further products, the constitution of which has not yet been determined.

FIG. 1



Graphic formulas of the follicular hormone and some chemical allies.

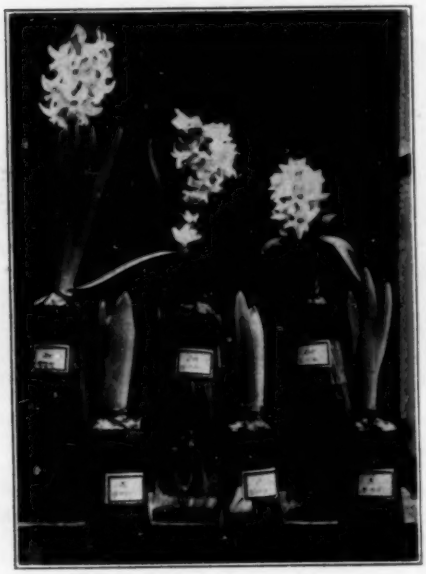
We do not know whether all these variants are necessary for the female sexual cycle, each carrying out part of the function, or if they are derivatives of the hormone proper metabolised perhaps for the purposes of excretion. This chemical complexity puts obstacles in the way of gynæcologists who have sought to determine the functional capacity of the ovary by estimating the amount of hormone in mouse units excreted in the urine. For example, if the α hormone is converted into hydroxide for the purpose of excretion this would produce a drop in the number of mouse units from 8–10 millions to 75,000 or so, and the investigator would thus be led to underestimate the output of the ovary.

The occurrence of the follicular hormone is not restricted to the animal kingdom. From the work of Loewe,[14] Dohrn,[15] and others we know that it also occurs in plants as, e.g., in germinating grain. This observation is particularly valuable since it shows a new link between the animal and vegetable kingdoms. Relevant hereto are Aschheim's [16] brilliant findings; in association with Hohlweg, he was able to prepare an oil containing the hormone from peat, coal, and petroleum. It is astounding that follicular hormone originating from plant or animal material should have remained undecomposed during the æons required for the formation of mineral coal or petroleum. According to estimates based upon amount and character of radio-active decomposition products, the age of Westphalian coal is estimated

* Based on a paper in the Deutsche med. Wochenschrift, 1932, No. 39. Published by Georg Thieme, Leipzig.

at 120 million years, and from it these workers were able to isolate a crude hormone oil containing some 3000 mouse units. When one considers how much coal is burnt yearly to obtain heat and energy it will be seen that the quantity of follicular hormone which is destroyed at the same time must amount to thousands of kilos.

FIG. 2



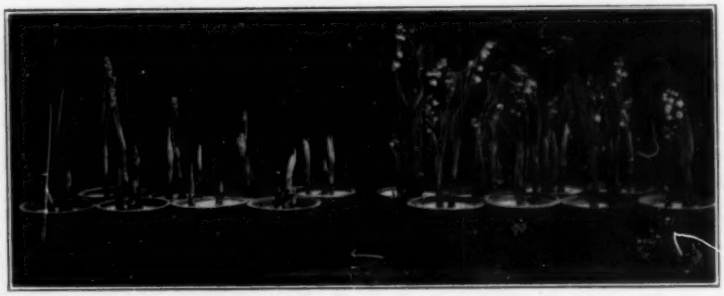
Above, three hyacinths growing in water to which was added over a period of six weeks 200 mouse units of progynon (œstrin). Below, three controls.

PLANT HORMONES

The action of the follicular hormone is not restricted to animals. Experiments of Schoeller and Goebel [17] have shown that the supply of small quantities of this hormone may accelerate the flowering of certain plants—e.g., hyacinths, arum lilies, and lilies of the valley. This work contained the first proof that the principle of hormone action established for animals evidently holds good also for plants. It opens up the questions vital to plant physiology; where are such substances produced and what other functions of plants are under hormonal control?

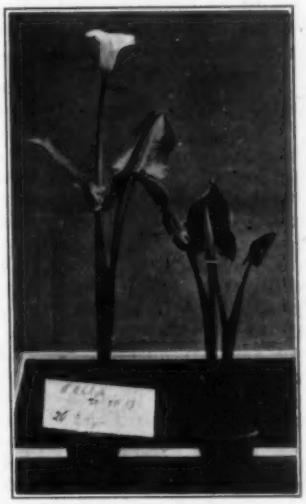
From this point of view the work of Went and Kögl (Utrecht) is worthy of close attention. The classical work of Went [18] on the decapitated Avena shoot has shown that phototropism (turning of plants towards the light) and geotropism (reaction of plants to gravity) are due to a chemical substance. This substance has the power of expanding plant cells and as it accumulates on the shady side in the one case or in the direction of gravity in the other it distends the cells and causes rotation of the plant. Recently Kögl [19] was successful in isolating this hormone, which he called auxin, in pure crystalline form. Its formula is $C_{18}H_{32}O_5$ and its chemical structure that of a trioxycarbonic acid. It is a remarkable fact that auxin also occurs in warm-blooded animals, but in them nothing is known of its action, other than that it is excreted in the urine. Through this work some insight is gained into two further secrets of plant life, and it remains to be seen whether leaf and root formation are also due to the stimulus of a hormone.

FIG. 3



On the right, lilies of the valley, which after supply of 300 mouse units of progynon (œstrin) weekly are vigorously flowering, compared with controls on the left.

FIG. 4



On the left, arum lily flowering under the influence of crystallized progynon (œstrin), and again a second time after the first flower withered, when further hormone was supplied. On the right a control.

THE CORPUS LUTEUM HORMONE

As was mentioned at the outset the presence of a second hormone, which is found in the corpus luteum, is essential to the female cycle. The fact that the corpus luteum exercises an endocrine function was shown by the work of Fränkel,[20] Buin and Ancel,[21] and Hammond and Marshall.[22] It was however Corner and Allen [1] who first obtained active extracts of the hormone and were able to maintain pregnancy after castration by their use. In Germany, Clauberg,[23] and in Austria, Knaus [24] have studied the effect of this hormone, while Fels and Slotta [25] claim to have isolated it in crystalline form.

According to Steinach and Kun,[26] the corpus luteum also produces the male hormone so that during the fourth week of the intermenstrual period, and in the early months of pregnancy, a woman is apparently bi-sexual. Corresponding with this observation, Womack and Koch [27] found male hormone in the urine of both normal and pregnant women and conversely, according to Dingemanse and Laqueur,[28] follicular hormone can be isolated from male urine.

That the sexual cycle of women demands a reasonable supply of both these hormones, follicular and corpus luteum, was recently demonstrated

by Kaufmann.[29] Injections of 320,000 mouse units of a follicular hormone derivative (progynonester) in the course of 18 days, followed by injections of 90 rat units of corpus luteum hormone in a woman castrated some years before, caused bleeding of four days' duration. In this menstrual blood he was able to demonstrate under the microscope elements of decidua; the atrophied uterus had proliferated so far as to develop under the influence of the corpus luteum hormone a real secretory phase.

THE MALE HORMONE

The story of the male sex hormone begins with the experiments made by Berthold [30] (Göttingen) in 1849 on the growth of the comb in capons into which he implanted testicles from sexually mature cocks. Although he drew the correct conclusion that the blood of the capons must have become altered in such a way as to allow their combs to grow again, neither he nor his contemporaries carried this very valuable observation any further. The famous experiments of Brown-Séquard [31] upon himself, which he presented to the Paris Academy 40 years later, also remained inconclusive. We owe it to the untiring efforts of the Chicago workers, Koch, Moore, and Gallagher [32] that crude extracts of bovine testicle were so far purified as to produce an effect on the combs of capons. Casimir Funk [33] is to be credited with the proof that the male hormone is excreted in the male urine, and can be prepared from it. Laqueur [34] and his school have made a valuable contribution to the standardisation of the hormone by devising the method whereby the shadow of the comb is reproduced on photographic paper and measured planimetrically.

A second test devised (1930) by Loewe and Voss [35] is based on the work of Steinach and the American school on the effect of male sex hormone on the secondary sex characteristics of castrated male

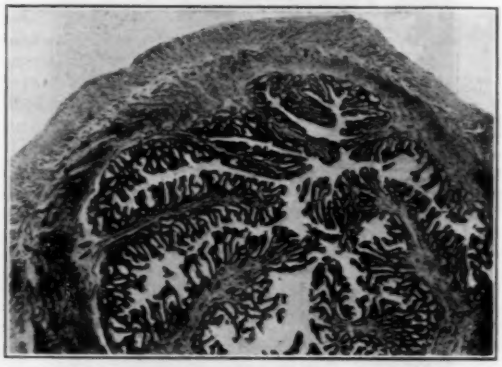
FIG. 5

Proliferation of the uterus of a castrated rabbit after treatment with 105 mouse units of progynon (œstrin).

rodents. The hormone is capable of producing externally visible regeneration of the atrophied seminal vesicles of castrates, corresponding in degree to the amount of hormone administered. Loewe observes the histological changes which precede this process. In the same way the hormone causes regeneration of the prostate, penis, and vas deferens of castrates

Again it was Butenandt [36] who was the first (1931) to prepare the male sex hormone in pure crystalline form from a hormone oil prepared according to a process devised by Schoeller and Gehrke [37] and supplied to him by Schering-Kahlbaum, A.G. The hormone has the formula $C_{18}H_{28}O_2$. It is also an oxyketone, but its hydroxyl group has the character of a secondary alcohol and not that of a phenol. It must be considered as a saturated system; whether it also belongs to the class of phenanthren derivatives, and is therefore closely related chemically to the female sex hormone, remains to be seen.

FIG. 6



Transformation of mucosa into decidua under the influence of corpus luteum hormone (Schering). Observation of Clauberg.

Further, it is not yet known whether the male sex gland produces one hormone only, or whether its several effects are produced by different, even though closely related, components.

ANTERIOR PITUITARY HORMONE AND THE SEXUAL CENTRE

Controlling both male and female genital glands there is the gonadotropic hormone of the anterior lobe of the pituitary, the action of which has been described in the works of Evans, Engle, Smith, Steinach,[38] Aschheim and Zondek.[39] Whether it is identical with prolan isolated by Aschheim and Zondek, obtained from pregnant urine, has not yet been definitely established. These workers have been led to believe that two separate components, prolan A and prolan B, are essential for the control of the ovarian cycle: A for the production of mature follicles, B for luteinisation. Neither the preparation of these two components in pure form nor their separation has yet been accomplished. The abundant excretion of prolan in the early days of pregnancy is the basis of the well-known Aschheim-Zondek reaction.

The study of the reaction of the gonads on the hypophysis has produced interesting results. Fichera [40] and other authors noted under the microscope, in the anterior lobe of the pituitary after castration, the appearance of large clear cells, the nuclei of which contain little chromatin, the so-called castration cells. Evans and Simpson [41] were able by means of implantation experiments to show an increased action on the gonads parallel to this histological change. Finally, Hohlweg and Dohrn [42] demonstrated that this reaction of castration on the hypophysis could be completely annulled by administration of sex hormone, a method which enabled them to estimate the production of hormone by the gonads of young warm-blooded animals (rats).

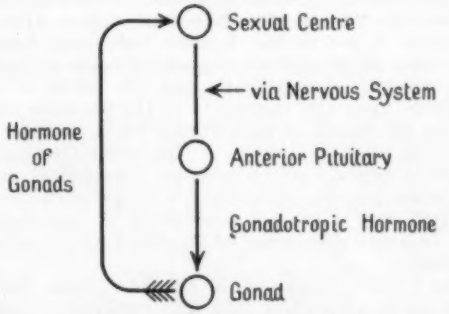
The reaction of the sex hormone on the hypophysis is, according to Hohlweg and Junkmann,[43] not a direct one, since in rats, in which a second hypophysis

had been implanted in the kidney, castration produced the characteristic changes only in the hypophysis which was normally situated. The appearance of these changes must therefore depend upon nervous influences which can only reach the animal's own hypophysis. This fact leads Hohlweg and Junkmann to assume the existence of a sexual centre, the site of which, from observations made by Teel and Cushing [44] on deficiency symptoms due to tumours, is probably in the floor of the third ventricle. If this is so the self-regulating control of the gonads may be expressed in some such scheme as Fig. 7.

This scheme explains also the valuable observation of Philipp [45] that the anterior pituitary lobe of pregnant women contains extraordinarily little gonadotropic hormone. Philipp assumes that during pregnancy prolan is elaborated in the chorionic portion of the placenta. Whether the gonadotropic hormone of the anterior pituitary is chemically identical with the prolan produced in the chorion is, as Freud [46] (Amsterdam) has very properly emphasised, not yet known, in spite of the great similarity in their action.

In a similar way, for the purpose of future experiments, it may be taken as a working hypothesis that the luteinising principle, necessary for the control of the female sex cycle, is not produced in the hypophysis but depends upon hormonal influence on the part of the ovum. Thus, if the unfertilised ovum dies in the normal way, the corpus luteum also perishes within a short time, whereas if, on the other hand, the ovum is fertilised and nidation takes place, the corpus luteum persists until the embryo has become independent. Again, according to this hypothesis, metropathies would be explained as the result of a lack of functionally active mature ova.

FIG. 7



Scheme of self-regulating control.

With the help of its gonadotropic hormone the anterior lobe of the pituitary stimulates the gonads to produce the specific sex hormone, the function of which is to develop and maintain the secondary sex characteristics. The sex hormones circulating in the blood act on the sexual centre which, according to whether the level of sex hormone in the blood is above or below normal, inhibits or stimulates the further production of the gonadotropic factor.

THE THYROTROPIC HORMONE

While the gonadotropic hormone of the anterior pituitary has the function of stimulating the activity of the gonads, its thyrotropic hormone exercises a similar effect on the thyroid. The work of Loeb,[47] Aron,[48] Jansen and Loeser [49] has shown that this hormone can eliminate colloid from the thyroid and stimulate the follicular epithelium. According to Junkmann and Schoeller [50] the hormone may be conveniently standardised by means of the thyroid of the young guinea-pig. Apparently the hormone can also produce the transformation of the axolotl. Its effect presumably is to raise the level of thyroxin in the blood. This also explains the heightened basal metabolism and the reduction of the glycogen content in the liver. Schittenhelm,[51] experimenting with large doses on voluntary patients, was able to produce early symptoms of Basedow's disease which then rapidly subsided.

From the chemical standpoint the thyrotropic hormone belongs, together with the gonadotropic hormone and insulin, to the class of hormone which is closely related to the proteins. They undergo digestion and are therefore inactive when given by the mouth; further they are more or less sensitive to heat and to hydrolysing agents. They are for the most part soluble in water, slightly soluble or insoluble in organic solvents.

Our present knowledge of the collective function of the hypophysis may be expressed in a diagram (Fig. 8).

FIG. 8

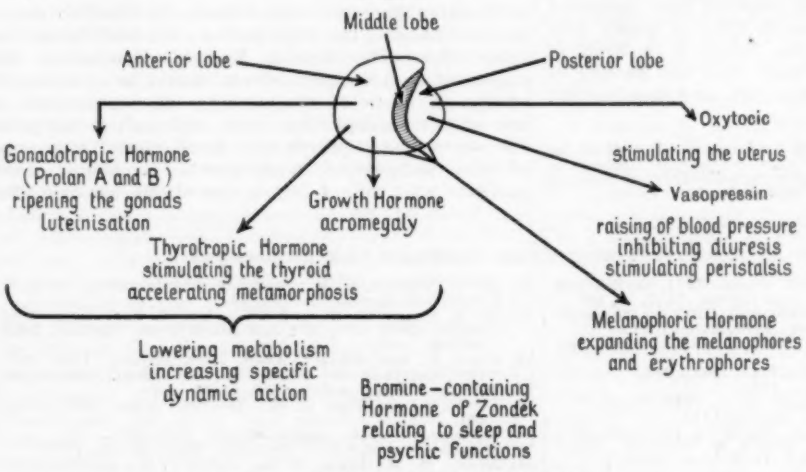


Diagram of collective function of pituitary.

The purpose of this summary of recent researches on hormones is to enable those who are not specialists in this field to study the original publication in this or that branch of the subject.

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(*Continued at foot of next page*)

OUT-PATIENT DEPARTMENTS

THEIR USE AND ABUSE

In January last the Prince of Wales, as president of King Edward's Hospital Fund, appointed a special committee "to inquire into and report upon the methods in use in the London voluntary hospitals regarding the attendance of patients in the out-patient and casualty departments, and the effect of those methods upon the suitability of the patients treated and on the length of time during which patients wait before or after treatment." This committee has now issued a report,[1] which includes a historical survey of the out-patient department, a review of the present position, and a general description of procedure, as well as a full discussion of the committee's terms of reference.

The report points out, in the first place, that the question of suitability falls into two parts—medical and financial—and that the out-patient department proper must be considered separately from the casualty department. Secondly, it stresses the gradual change that has come over the out-patient departments of voluntary hospitals, which were originally places for the simple treatment of the sick-poor, but are now available to members of contributory schemes and to patients who pay a moderate fee, and which provide every year an increasing amount of complex service and treatment which is not available elsewhere at a reasonable charge.

The committee has no doubt that the hospitals maintain their popularity, and all the evidence confirmed the statement that they had the confidence of the working-class population. The annual attendances at the twelve teaching hospitals have increased from two and a half million in 1911 to nearly four million in 1931. There was, however, a drop in the number of medical patients after the passing of the National Health Insurance Act, and this has not been made up, although the figure has been rising since 1917. The surgical figures were not affected by the Act. The discrepancy between patients and attendances since 1911 and the increase in medical patients since 1917 probably reflect the increasing number of complex diagnostic measures which require hospital attendance, and of special treatments that need repeated visits, as well as a rise in the average seriousness of the hospital medical case. Very few complaints have been received from patients, and these were mostly concerned with waiting and overcrowding, and not with any inefficiency or inadequacy of service. The committee realises, however, that there is no channel for complaints and thinks it important that there should be one.

[1] King Edward's Hospital Fund for London. Report of the Committee appointed to inquire into Out-patient Methods at London Voluntary Hospitals as affecting suitability of patients and time of waiting. London. 1932. Pp. 76. 1s. 6d.

TIME OF WAITING

There seems to be no doubt, despite the vagueness of some of the evidence, that patients do have to waste a good deal of time in out-patient departments, though not in casualty departments or special departments, except those for eye and ear.

Four chief theories of the cause of delay have been put forward to the committee. One regards waiting as inevitable and only to be obviated by quite impracticable increases in staff and accommodation; another puts it down to overcrowding and thinks that it could be remedied by improvements in accommodation; a third ascribes it to remediable defects in procedure; and a fourth to unsatisfactory selection of patients, many being sent to the consultant when they could properly be treated elsewhere. There are hospitals which still maintain that their doors must always be open to all-comers, and there are others who will admit only patients bearing a letter from a medical man. On the whole, hospitals are tending more and more towards the latter extreme, and emphasising the consultative nature of the service they offer. The British Medical Association has suggested that doctors' letters should be compulsory except in cases of emergency. The committee is not able to accept this view, although it supports the movement towards the more consultative use of the out-patient department. It thinks that patients who cannot pay a consultant fee and who

NEW WORK ON HORMONES: REFERENCES (*continued from previous page*)

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want a second opinion should be able to get one at a hospital without having to obtain a letter from a general practitioner; they may be shy of asking him, or they may not be in touch with a doctor; and the doctor is by no means necessarily the best person to decide whether or not a hospital opinion is desirable.

THE "MINOR AILMENT" CASE

An undoubted cause of overcrowding and consequent waiting is, in the opinion of the committee, the treatment of large numbers of "minor" cases, and the question of alternative provision for these is therefore a very pertinent one. It is bound up to some extent with the problem of financial suitability. Some hospitals feel that a patient who is so poor that he cannot obtain the necessaries of life or pay the smallest fee is not likely to benefit from treatment, and had better be dealt with by the public assistance authority, which can supply both medical treatment and any form of relief required to make it effective. Other hospitals hold to the older idea that they were founded for the treatment of the sick-poor and must turn no one away. A far larger class comes within the "income range" established by the hospitals and could, in the opinion of the British Medical Association, afford to pay general practitioners for treatment for these minor ailments or could obtain what they need by means of an insurance or provident dispensary scheme. There is yet a third class with incomes above the range of public assistance who yet find a general practitioner's fees a severe charge on their incomes. Nevertheless, when all exceptions have been excluded, there remains, in the opinion of the committee, a very considerable number of patients attending hospitals for minor complaints which could properly be treated elsewhere. The report discusses at some length the alternative provision available for these people.

In so far as they are not treated by the consultants personally, they must be referred either to general practitioners or to the junior staff of the hospital. Some authorities argue that the junior staff are more up to date and efficient than the general practitioners; others that they lack the breadth of view and experience of the man outside. While not feeling called upon to express an opinion on the merits of the practitioner, the committee points out that treatment of minor ailments by the junior staff will not greatly assist the problem under consideration: overcrowding of the hospital. The report therefore urges greater coöperation between hospitals and practitioners—for the benefit of both.

Besides private practitioners, there are provident dispensaries, public medical services, charitable dispensaries, voluntary and public clinics, public assistance provision, and nursing services. All of these could play their part in relieving hospital congestion, and the committee stresses the importance of coöperation with them all. It further recommends that hospitals should do all they can to let doctors know the hours of the various consultants, so that patients are not sent up with personal letters on the wrong days, and to send reports on cases, while doctors should supply adequate case-notes when sending their patients to hospital. A vicious circle is very apt to develop, and goodwill and a realisation of the value of each to the other is necessary if practitioners and hospitals are to make the best possible use of each other for the best service of their patients. Against the additional work required for coöperation might be set the reduction in numbers. The more competent and experienced the doctor who does the sifting, the less the likelihood of mistake or dissatisfaction. Sifting takes time, but the time is probably saved in other departments. The problem of minor cases cannot be considered without reference to the needs of the medical student, but the committee is of opinion that, although the minor case is necessary for education, great reduction in the present numbers could be effected without harming the teaching work.

DELAY DUE TO PROCEDURE AND LACK OF ACCOMMODATION

The report discusses carefully the various procedures by which out-patients are received, registered, and interviewed, but is unable, amidst the diversity, to pronounce a judgment on the best method. It desires further records of time-counts showing how long each way takes, and advises all hospitals to consider whether changes in procedure might not accelerate the service. Time may be saved by arranging special sessions for special classes of patient—e.g., discharged in-patients, young people between 14 and 16, and so on. The appointments system has been warmly defended by some hospitals, whether the appointment be given to individuals or to groups, and the committee feels that this possibility demands attention. Some hospitals limit the number of patients that may be seen at a session, and others offer a number of improvements in general organisation that the committee recommends to the consideration of those who have not adopted them already. Even if the time of waiting is not reduced thereby, the grumbling at it may be effectually stopped by seeing that the waiting-hall is warm and comfortable and that refreshments are available.

Waiting time is certainly reduced by the provision of adequate dressing rooms and examination rooms, and by the existence of suitable special accommodation for special departments. Time is saved if patients do not have to traverse long corridors from one room to another.

THE COMMITTEE'S CONCLUSIONS

In summary, therefore, the chief conclusion of the committee is that the out-patient problem can be materially reduced by sifting out a large proportion (but not all) of the minor cases and arranging for their treatment elsewhere than in the consultant's room. The hospital should be prepared to use to the utmost all coördinated services to which patients can be referred, and should particularly endeavour to satisfy the requirements of the general practitioner who, in his turn, should do all in his power to use and accelerate the service the hospital can render him. The committee thinks the present movement towards a more consultative service is a movement in the right direction, but does not recommend carrying it to the extreme of excluding patients who desire a second opinion and cannot afford it privately. It views with favour the proposal to supply both practitioners and consultants with standard forms to send with the patients. Every hospital, it considers, should study the procedure in use at other hospitals and consider whether there is not room for improvement in its own routine. The King's Fund is advised to see how it can help the hospitals to carry out the committee's recommendations.

NORTHAMPTON GENERAL HOSPITAL.—The report for 1932 shows 4629 in-patients, an increase of 422 on last year; of these 1772 were accidents and emergencies. Average stay, 18 days, cost £7 14*s.* 5*d.*, and cost per bed per day 8*s.* 10*d.*—small reductions under each head. Out-patients exceeded 19,000, an increase of more than 800, who cost 7*s.* 2*d.* each. Ordinary income £43,143, expenditure £44,278.

THE VALUE OF MASSIVE RADIATION

FINAL REPORT OF THE CONFERENCE ON RADIUM

THIS Conference owed its origin to doubts publicly expressed as to the soundness of the decision of the Radium Commission to withdraw the 4-gramme bomb, then in use for massive radiation at the Westminster Hospital, and subdivide it into four units of 1 gramme each. It consisted of the following members :—

Lord Dawson of Penn, President of the Royal College of Physicians of London, in the chair.

Lord Moynihan—now succeeded by Sir Holburt Waring—President of the Royal College of Surgeons of England.

Mr. Wilfred Trotter, representing the Medical Research Council.

Sir Frederick Menzies, Chief Medical Officer, L.C.C.

Dr. Watts Eden, President of the Royal Society of Medicine.

Mr. H. S. Souttar, representing the B.M.A.

Prof. Arthur Hall, Mr. Ernest Miles, and Prof. Woodburn Morison, representing the Radium Commission.

INTERIM REPORT

In an interim report, dated March 4th, 1932,[1] the Conference decided unanimously :—

(1) That the Radium Commission arrived at a sound conclusion in discontinuing the use of the 4-gramme bomb at the present juncture, though this decision is without prejudice to the question of the therapeutic value of 4 gramme or even larger aggregations of radium.

(2) That in the opinion of this Conference a fully equipped radium institute is needed in London, where the more difficult and speculative problems connected with radium and ray therapy can be studied by the combined efforts of a trained staff.

The Conference appointed a technical committee as follows :—

Chairman.—Mr. H. S. Souttar.

Physics.—Lord Rayleigh, F.R.S., Prof. J. C. M'Lennan, F.R.S.

Radiotherapy and Medicine.—Dr. Roy Ward, Radium Institute; Dr. G. F. Stebbing, Lambeth Hospital, L.C.C.; Dr. B. W. Windeyer, Middlesex Hospital.

Surgery.—Mr. Cecil Rowntree, Cancer Hospital; Mr. Geoffrey Keynes, St. Bartholomew's Hospital.

Gynæcology.—Mr. Louis Rivett, Middlesex Hospital; Dr. Elizabeth Hurdon, Marie Curie Hospital.

Experimental Radiation.—Dr. W. Cramer, Imperial Cancer Research Fund Laboratory.

Representatives of the Conference.—Lord Dawson and Lord Moynihan.

FINAL REPORT

This committee reported finally on Dec. 19th, 1932. After considering their findings, which are set out below, the Conference has issued a short statement which runs :—

"It is clear that there is a field of usefulness for radiation from massive units of radium, given an adequate equipment and men and means. We adopt the view of our technical committee that it is desirable that a radium unit containing not less than 5 grammes of radium element should be established.

"An institute specially constructed for the purposes of such radiotherapy and within easy reach of the future Post-graduate School and Hospital is an ideal to be aimed at, but for the moment it may be impracticable upon financial grounds. It would, however, be feasible to organise existing institutions for the time being, provided they were near enough to each other for efficient coöperation. The amount of radium required for a large unit might mean that the allotment of radium by the Radium Commission would need to be further concentrated.

"Both X ray and radium therapy are at present advancing so rapidly that it is impossible to decide the position which each will occupy in the future. The whole field is one for the fullest investigation, and it is one in which results of the first importance have already been obtained.

"In drawing up this report," which is signed by Lord Dawson, "the Conference has purposely refrained from considering the relative places occupied by surgery and radiotherapy in the treatment of malignant disease."

Two Questions Submitted to the Technical Committee

The technical committee were asked for a reply to these questions :—

1. What is the scientific case for mass radiation by radium, and what are the advantages and dangers attaching to the use of such radiation ?

2. What are the advantages and risks of massive surface radiation by radium compared with those of radium needles and radon seeds ?

Their report, which is a reply to the questions, is as follows :—

Selective action of radiation upon malignant cells.—The use of radium in the treatment of malignant tumours depends upon the empirical observation that in a large number of instances the cells of malignant tumours are destroyed by an amount of radiation insufficient to destroy the normal tissue. This proposition is generally true over a very large range of wave-lengths, and certainly holds over a range which extends from X rays with a wave-length of 1 A.U. to hard gamma rays with a wave-length of 0·04 A.U. or less. In spite of an immense amount of research devoted to this particular point, it is still uncertain whether there is any specific difference between the longer and shorter waves in their effect upon the cells, although there is a general impression that radiation of short wave-lengths has a higher degree of selective action upon the cells of malignant tumours in virtue of their rapid growth.

Penetrating power of short waves.—What is, however, quite certain is the physical fact that radiation of short wave-length has a higher penetrating power, and is therefore capable of conveying energy into the deeper tissues, whilst radiation of longer wave-length is absorbed in the more superficial tissues and there expends a large part of its energy. It is for this reason that X ray apparatus is being made to generate X rays of shorter and shorter wave-length, but no apparatus has yet been devised to generate waves as short as the gamma rays of radium. These short wave generators are still on trial, and it is of importance that we should be able to compare the results obtained from them with those obtainable from mass radiation by radium.

PROBLEM OF THE UNIFORM FIELD

The margin between general destruction of the tissues and selective destruction of the malignant cells which are invading them is very small, and it is therefore an essential factor in treatment that every element of tissue throughout the region treated should receive exactly the same amount of radiation, for if at any point there is a defect some malignant

[1] See THE LANCET, 1932, i., 1110.

cells will survive; whilst if at any point there is an excess the supporting tissues will be destroyed. In the treatment of malignant tumours by radiotherapy, whether by means of X rays or of radium, there is indeed a general agreement upon the importance of obtaining a uniform field of radiation throughout the region under treatment. Whatever method has been adopted its clinical success has always been proportional to the accuracy with which this physical problem has been solved, and there are strong grounds for believing that upon its more complete solution may depend the whole future of radium therapy in the treatment of cancer.

So far therefore as our present knowledge is concerned, the solution of the exceedingly complicated clinical problem of the treatment of malignant tumours by radiation would appear to depend primarily upon the solution of the physical problem of obtaining a uniform field of radiation—that is to say, a field throughout which the scalar value of the energy absorbed is constant both in the cross section and in the depth of the field.

The advantage of gamma rays.—For this purpose gamma rays present a very definite advantage over X rays, since owing to their shorter wave-length they have a proportionately greater penetration. Although in both instances the intensity of the field diminishes with the distance from the source, it is far less affected in the case of gamma rays by the absorption of the tissues, and it is therefore easier to maintain a uniform field as the depth below the surface increases.

It is true that the great volume of power available in the modern X ray tube allows of a greater working distance, so that the proportion of energy delivered in the depth of the body by X rays may be equal to or even greater than that obtained from radium. But the use of such a volume of energy presents a disadvantage, since there is general agreement that X rays produce more constitutional disturbance than do gamma rays of equal adequacy, possibly owing to the more complete absorption which X rays undergo in the tissues.

The relative value of the two methods can only be discovered by further experience.

MODES OF APPLYING RADIUM

Massive radium units at a distance.—The use of massive units of radium outside the body furnishes a powerful means of subjecting a region of considerable volume to a uniform radiation by gamma rays, and if a sufficiently large quantity of radium were available this would prove the most perfect physical solution of the problem. It is not, of course, sufficient to use a single beam, since the unavoidable fall in intensity as the distance from the surface increases necessitates a dosage which exposes the proximal tissues, and especially the skin, to an excessive radiation. This, however, may be overcome by the use of multiple ports of entry, and by exact calculation an almost perfectly uniform field can be obtained throughout any volume of tissue where it is required.

Other methods.—The difficulty of obtaining sufficient radium for use by this direct method has compelled surgeons to devise other methods, by which radium, being brought into closer contact with the tissues, is used to greater economic advantage. The application of radium plaques, the insertion of needles, and the insertion of seeds all come under this heading, and there is no doubt at all that when properly applied in suitable regions they may combine economy with efficiency. They present a further advantage that, owing to the smaller amount of radium used, the effects are strictly localised, and neither the patient nor the attendants are exposed to the possible dangers associated with large quantities of radium.

Defects and limitations of interstitial methods.—Although these methods have in many instances given brilliant results, and are probably of permanent value, they present the disadvantage that they do not produce the ideal uniform field of radiation, and in spite of their success it is still an open question whether massive radiation may not produce even better results when applied to the same situations. This view is certainly supported by the work of Berven on cancer of the buccal cavity, where the results obtained are far superior to those which have hitherto been accomplished either by surface or interstitial methods. The question is one of the greatest importance, but it can only be settled by future work.

The use of needles and of seeds is further limited by the fact that it necessitates surgical access to the region of the tumour, and not merely to the tumour itself but to the whole of the neighbouring lymphatic area through which it may disseminate. This is often undesirable and frequently impossible, and indeed there is only a limited number of situations in which it is possible to treat effectively by these means the whole region under suspicion.

Regions still to be explored.—In spite of the variety of methods now available it is still only in special instances that radiotherapy has been applied to cancer with success, and there remain whole regions where this has not yet been achieved or even seriously attempted; as examples we may cite deep-seated tumours in the thorax and abdomen. It is here that massive radiation with its penetrating rays appears, at first sight, to offer the solution of the problem, but difficulties arise which are not merely physical but are inherent in the disease.

Such tumours are inaccessible to early diagnosis, and in the great majority of cases are far too advanced when diagnosed for treatment of any kind to be successful. They arise often in tissues which are themselves very radiosensitive such, for example, as the stomach, the intestine, and the rectum, and the annihilation of the tumour may involve the destruction of the organ from which it has sprung. Moreover, the exact extent of lymphatic involvement cannot be determined, so that it is difficult to ensure the complete irradiation of all malignant cells.

In spite of these difficulties there are definite grounds for hoping that by some combination of irradiation and surgery even cancer of the alimentary tract may ultimately be brought under control. In this achievement it is the definite opinion of such cautious observers as Forssell and Regaud that radiation from a distance, either by massive radium units or by X rays at a potential not yet obtained, will play an essential part.

THE DANGERS OF RADIUM

Although there is still very little known about the precise action of gamma rays upon the tissue cells, practical experience is so far advanced that any of the methods which we have mentioned may be employed by experts without danger either to the patients or to themselves. In the hands of the inexperienced the use of radium in any form is dangerous, and an attempt to assess the degree of danger would be more curious than useful.

The insertion of seeds or needles or the application of local plaques in expert hands leads to the disappearance of a tumour with only a moderate local

reaction, and, except in the case of a large tumour, with very little constitutional disturbance. A faulty estimation of the dosage or an uneven distribution may lead to gross destruction of the tissues, extensive ulceration of a most painful and intractable type, and even to the death of the patient, whilst there can be no guarantee that the tumour itself has been destroyed. It is true that with a larger mass of radium destruction might be extended to an even wider sphere, but that is the only difference.

All the evidence before us goes to show that the use of massive units of even the largest dimensions can be so completely controlled that the safety of the patient is assured. The occurrence in some instances of severe constitutional disturbance has always been due to some error in technique, and has been avoided on further experience. We are satisfied that there is no foundation for the idea that the use of a massive unit is necessarily associated with any special danger to the patient.

CONCLUSION

The evidence has convinced us that the treatment of cancer by radiation from a massive radium unit (tele-radium) is a method the value of which has already been proved, although so far only in a limited field. How far these limits can be extended is a question which can be solved only by coördinated clinical, experimental, and physical research in which this country ought to take its share. The larger the unit available the more rapidly will its possibilities be discovered, and the wider will be the field which can be explored.

After a full consideration of all the evidence available we are convinced that a large radium unit should be erected in this country, under conditions where such coördinated effort is possible, containing not less than 5 grammes of radium element.

Material on which Report is Based

The technical committee held eight meetings, the first at the Royal College of Physicians on June 16th, 1932. Visits of inspection were made, including one to the Westminster Hospital annexe. The report is based upon personal experience in the various branches of radiotherapy to which members of the committee individually devoted special attention, and upon personal observations following visits to radium centres in London, Manchester, Birmingham, Paris, Brussels, Stockholm, and New York. The committee heard evidence from Prof. Sydney Russ, Mr. E. Rock Carling, and Mr. Stanford Cade, and saw a confidential report from Mr. Comyns Berkeley, who had visited most of the European radium centres on behalf of the League of Nations. To obtain the latest information about the progress of treatment by massive units, Prof. M'Lennan and Mr. Souttar paid visits to the radium institutes of Paris and Stockholm.

VISIT TO PARIS

In an interview with Prof. Regaud at the Institut Curie he stated that his experience of the use of 4 grammes of radium for distance therapy began in 1924, and had extended continuously over eight years, during which only minor alterations had been made in the construction and mounting of the apparatus.

The apparatus consists in a square lead box with walls 6 cm. in thickness, and with an internal area of 150 sq. cm. The radium is contained in 80 platinum tubes with walls 1 mm. in thickness, and is arranged in four groups of 20 tubes each on an internal frame, so that they are situated at the corners of the lead box. The opening of the box is closed up by a block of wax of such dimensions that the plane of the radium is at a distance of 10 cm. from the skin of the patient. As a general rule the treatment extends over 70 hours, and is divided into doses of from two to four hours according to the tolerance of the patient.

Prof. Regaud had never seen any injury to the patient, either local or general, nor any evidence that the treatment had been injurious. Sensitive patients often experienced sickness after the treatment, but this soon passed off and did not recur if a diminished dose was given on the next occasion.

Carcinoma of the stomach.—Twenty-five cases had been treated after surgical exploration, which had proved that the case was in fact carcinoma and inoperable. In the first group of cases the dose was inadequate (600–900 mc.d.), and no effect of any kind was observed. In later cases the dose was increased to as much as 1200 mc.d., and definite improvement was noted in several instances. Two cases of proved carcinoma are alive and free from symptoms after more than four years.

Carcinoma of the cervix.—One hundred cases were divided into two similar groups of 50 each. One group was treated by deep X rays working on a potential of about 200 kv., the other was treated by radium at a distance. The same local treatment was used in both cases. No difference whatever in the results was noted. Of Class I. (early cases) the percentage free from symptoms for five years was 83, whilst in Class III. (advanced cases) the percentage was 34.

Prof. Regaud regards deep X rays as the established method, and radium at a distance as an interesting and hopeful experiment. He considers it of great importance that far larger amounts of radium should be used. He has arranged for the 4-gramme unit at present in use to be increased almost immediately to 8 grammes, and in conjunction with Murdoch, Forssell, Holthusen, and Morison for the provision of a 15-gramme unit at Brussels. He is not, however, convinced that developments in X ray apparatus, and the raising of the potential to perhaps a million volts, may not again place X rays at an advantage as compared with radium.

Dr. Lacassagne, assistant director to the Institut, regarded as of extreme importance in treatment the accurate orientation of the unit, and the limitation of the period of treatment to the tolerance of the patient. It was impossible, he thought, to treat two patients at the same time satisfactorily. Neither Regaud nor Lacassagne regarded the very wide field exposed in their unit as in any way dangerous; it enabled them in fact to treat a larger volume of tissue. It did not involve any special danger to the liver, spleen, kidneys, or pancreas; a case of carcinoma of the liver had been treated with success, and without untoward result, the patient being alive four years later. They regarded the skin as one of the most sensitive structures in the body, and the arrangement of their treatment was largely directed to its protection.

At the Hospital, 33 rue Antoine Chantin, where the 4-gramme radium unit is situated, Dr. Monod explained the method of using it and of charting the treatment.

The unit is chiefly employed for the accessory treatment of carcinoma of the cervix, and in most cases the course of treatment extends over 21 days, during which the patient receives the radiation from 2100 mc.d. The aperture of the unit is 150 sq. cm., and in every case the treatment is given with the radium at a distance of 10 cm. from the skin. For the first two weeks the period of treatment is three hours on each day, but in the fourth week this is increased to four hours. The exposures are made through seven distinct portals in rotation, so that the same portal is not employed again until after the lapse of a week. The unit will shortly be increased to 8 grammes, without altering the mounting or screening.

A visit was also paid to the suburban Anti-Cancer Centre at Villejuif, 14 Avenue des Ecoles, where a 2-gramme is used as an accessory to local treatment, and chiefly in carcinoma of the cervix. Exposures varied with the tolerance of the patient; in most

instances two exposures a day were given varying between two to four hours each. Dr. Wickham expressed himself as satisfied with the results.

VISIT TO STOCKHOLM

At Radiumhemmet, Dr. Ellis Berven, director of the Institute, demonstrated some twenty cases of carcinoma of the mouth and pharynx treated by the following technique: (1) primary treatment with the unit, (2) removal of any remaining growth by endothermy, and (3) final treatment by surface application of radium element. In the more recent cases the success of the treatment by the unit had been so considerable that no other procedure had been required. Among the cases were:—

A woman of 54, treated five years ago for sarcoma of the right tonsil. No recurrence, and the only trace of treatment slight scarring of the anterior pillar of the fauces.

A man of 62 with carcinoma of the right tonsil invading the back of the tongue, with large secondary masses in the neck. This man was treated three years ago by the unit only. No trace of any growth was discoverable, and beyond extensive scarring and telangiectasis in the neck, and some scarring of the tonsillar region, there was no evidence of previous disease.

A man of 52 with carcinoma in the left floor of the mouth extending far back towards root of the tongue, with a small secondary gland. There is now no trace whatever of disease.

A man of 65 with an extensive carcinoma actually infiltrating the greater portion of the left lower jaw. Six months ago this man was treated exclusively with the unit. The surface had healed entirely, excepting for a small area of necrosis where the dead bone had not yet separated.

The great bulk of the cases were inoperable when first seen, and most of them might have been regarded as surgically impossible, even from the point of view of alleviation. Dr. Berven admitted a certain percentage of failures. The unit was applied in general through an average of six ports of entry, arranged so as to provide full concentration on the tumour, but to avoid injury to the skin. With the exception of one or two cases where fixed glands had demanded an excessive local dose there was no trace of skin reaction.

Prof. Rolf Sievert, who designed the unit, demonstrated its construction.

It consists of a heavy mass of lead arranged in the form of the letter L, and pivoted about the middle of the longer limb. The radium itself is contained in a flat carrier, which can be inserted into either of two slots placed near the extremities of the two limbs of the L. The box contains 60 tubes of 50 mg. of radium element each, making 3 grammes in all, and it is so arranged that these tubes can be concentrated at the centre or brought out to the sides of the box by an external lever. When inserted in the short end of the unit the radium is brought into its central position. It is protected by the equivalent of 5 mm. of lead, and its distance is 6 cm. from the skin surface. The maximum aperture is a circle of 5 cm. in diameter. At the larger end the skin distance is again 6 cm., with a maximum aperture of 8 cm.

The unit is so mounted and placed as to move with the greatest facility into any position. The smaller end is used for situations where the introduction of the larger end would be anatomically impossible, such as the neck and the perineum. It has, however, a smaller lead protection, the thickness being here only 2·5 cm., as against 6 cm. at the heavy end.

Dr. Sievert also showed his new system of measuring ionisation and thereby determining the intensity of gamma rays with precision.

The essential part consists of two concentric spheres of metal insulated from one another by four points of amber. They can be of small size; in one the outer sphere was only 5 mm. in external diameter. The principle consists in charging the inner sphere to a high potential and then placing the instrument for a known time in a region to be investigated. The inner sphere is discharged by ionisation across the intervening air space at a rate proportional to the radiation, and a measurement of the charge remaining on the inner sphere enables the radiation to be determined with great exactness. These instruments have been charged in Stockholm, sent to America, there exposed to radiation, and returned to Stockholm, when it has been found possible to determine the value of the radiation to which it had been exposed within an error of 2 per cent.

In conversation Prof. Gösta Forssell expressed the opinion that with larger supplies of radium it ought to be possible to obtain even better results than those which had been shown. He saw no reason why, with sufficient quantities of radium and with sufficient experience in its application, it should not be possible to deal successfully with cancer in any region of the body. Although at present carcinoma of the intestinal tract was outside the possibility of direct treatment, he was convinced that by some combination of surgery and radium it could ultimately be brought under control. He attributed the success achieved in the Stockholm clinic to two chief factors: the combined team-work of a group of men, each expert in his own department, and the extreme precision with which the whole of their work was controlled.

THE FUTURE OF AMERICAN MEDICAL PRACTICE

(FROM AN OCCASIONAL CORRESPONDENT IN THE UNITED STATES)

AFTER five years' study the Committee on the Costs of Medical Care has published its final report. The committee is an unofficial body of doctors, public health officers, sociologists, and representatives of the general public. Its object, in the words of President Hoover, is to propose plans "for the delivery of adequate scientific, medical care to all of our people, rich and poor, at costs which can be reasonably met by them in their various stations of life."

In the authorised summary of its report the total cost of medical care for the nation in the year 1929 is estimated at $3,656,000,000. Attention is called to the uneven incomes of medical practitioners. The average net income of the general practitioner is found to be less than $4000, while that of the specialist is over $10,000. The expenditure of the medical dollar is made up as follows: physicians, 29·8 cents; hospitals, 23·4 cents; dentists, 12·2 cents; medicines, 18·2 cents; public health, 3·3 cents; nurses, 5·5 cents; "cultists," 3·4 cents; all others, 4·2 cents.

DEFECTS OF THE PRESENT SYSTEM

The present system of medical care is found to be deficient in nine respects:—

1. The people need a substantially larger volume of scientific medical service than they now utilise. This is particularly true of persons with small incomes. In spite of the large volume of free work done by hospitals, health departments, and individual practitioners, and in spite of the sliding scale of charges, it appears that each year nearly one-half of the individuals in the lowest income group receive no professional medical or dental attention of any kind, curative or preventive.

2. Modern public health services need to be extended to a far greater percentage of the people, particularly in rural areas, towns, and small cities.

3. There is need for a geographical distribution of practitioners and agencies which more closely approximates to the popular medical requirements.

4. Current expenditures for medical care, in rural and semi-rural areas, are insufficient to ensure even

approximately adequate service, to support necessary facilities, or to provide satisfactory remuneration to the practitioners.

5. Many practitioners, particularly well-trained recent graduates, should have opportunities to earn larger net incomes than they now receive. Incomes of general practitioners and of specialists should be more nearly equal than at present. The opportunity and incentive for "fee-splitting" should be removed.

6. Better control over the quality of medical service is needed, and opportunities should be provided for improving quality as rapidly in the future as it has been improved in the past. Improvement of the quality of service would include: Elimination of practice by unqualified "cult" practitioners; control over practice of secondary practitioners (like midwives, chiropodists, and optometrists); restriction of practice of specialties to those with special training and ability; more opportunity for post-graduate study for physicians, particularly rural practitioners; more opportunity for physicians to exchange experiences and to assist each other; better control, through supervision and further education, over the work of certain physicians and dentists who even though regularly licensed are not competent for many functions.

7. There should be more effective control over the number and type of practitioners trained, and their training should be adjusted to prepare them to serve the "true" needs of the people.

8. There is a need for reduction of waste in many directions, such as the money spent on unnecessary medication, on services of poorly qualified or utterly unqualified "cultists"; and in wastes due to idle time of practitioners, high "overhead" charges of private medical and dental practice, unused hospital accommodations, and the sending of patients from place to place for medical service.

9. There is need for some plan whereby the unequal and sometimes crushing burden of medical expenses can be distributed. The prevailing methods of purchasing medical care lead to unwise and undirected expenditures, to unequal and unpredictable financial burdens for the individual and the family, to neglect of health and of illness, to inadequate expenditures for medical care, and often to inequable remuneration of practitioners.

REMEDIES

The Committee's solution for the uneven burden of cost and the uneven rewards for service is that group service shall be rendered in return for group payment. The majority recommendations are as follows:—

1. Medical service, both preventive and therapeutic, should be furnished largely by organised groups of physicians, dentists, nurses, pharmacists, and other associated personnel. Such groups should be organised, preferably around a hospital, for rendering complete home, office, and hospital care. The form of organisation should encourage the maintenance of high standards and the development or preservation of a personal relation between patient and physician.

2. The committee recommends the extension of all basic public health services—whether provided by governmental or non-governmental agencies—so that they will be available to the entire population according to its needs. Primarily this extension requires increased financial support for official health departments and full-time trained health officers and members of their staffs whose tenure is dependent only upon professional and administrative competence.

3. The costs of medical care should be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both these methods. This is not meant to preclude the continuation of medical service provided on an individual fee basis for those who prefer the present method. Cash benefits—i.e., compensation for wage-loss due to illness—if and when provided, should be separate and distinct from medical services.

4. The study, evaluation, and coördination of medical service should be considered important functions for every State and local community; agencies should be formed to exercise these functions, and the coördination of rural with urban services should receive special attention.

5. The committee makes the following recommendations in the field of professional education:—

(*a*) That the training of physicians give increasing emphasis to the teaching of health and the prevention of disease; that more effective efforts be made to provide trained health officers; that the social aspects of medical practice be given greater attention; that specialties be restricted to those specially qualified; and that post-graduate educational opportunities be increased.

(*b*) That dental students be given a broader educational background.

(*c*) That pharmaceutical education place more stress on the pharmacist's responsibilities and opportunities for public service.

(*d*) That nursing education be thoroughly remoulded to provide well-educated and well-qualified registered nurses.

(*e*) That less thoroughly trained but competent nursing aides and attendants be provided.

(*f*) That adequate training for nurse-midwives be provided.

(*g*) That opportunities be offered for the systematic training of hospital and clinic administrators.

MINORITY RECOMMENDATIONS

The principal minority report is signed by nine members. Since it may be said to represent the official viewpoint of the American Medical Association it is also given here in full.

1. The minority recommends that government competition in the practice of medicine be discontinued and that its activities be restricted (*a*) to the care of the indigent and of those patients with diseases which can be cared for only in governmental institutions; (*b*) to the promotion of public health; (*c*) to the support of the medical departments of the Army and Navy, Coast and Geodetic Survey, and other government services which cannot because of their nature or location be served by the general medical profession; and (*d*) to the care of veterans suffering from bona-fide service-connected disabilities and diseases, except in the case of tuberculosis and nervous and mental diseases.

2. Government care of the indigent should be expanded with the ultimate object of relieving the medical profession of this burden.

3. The minority joins with the committee in recommending that the study, evaluation, and coördination of medical service be considered important functions for every State and local community, that agencies be formed to exercise these functions, and that the coördination of rural and urban services receive special attention.

4. United attempts should be made to restore the general practitioner to the central place in medical practice.

5. The corporate practice of medicine, financed through intermediary agencies, should be vigorously and persistently opposed as being economically wasteful, inimical to a continued and sustained high quality of medical care, or unfair exploitation of the medical profession. . . .

7. The minority recommends the development by State or county medical societies of plans for medical care.

Two dentists have signed a separate report agreeing in most respects with the majority, while Prof. W. H. Hamilton, of Yale University, presents a private solution of his own. The million dollars provided for this study has now been spent. No money was appropriated for promotion of the plans which the committee has evolved. Nevertheless the chairman of the committee, Dr. Ray Lyman Wilbur, Secretary

of the Interior, who will shortly return to his non-political position as president of Stanford University, expresses the hope that a continuing organisation may immediately be formed to promote demonstrations in local communities.

MEDICINE AND THE LAW

Nuisance by a Mental Patient

LEGAL text-books say there is no recorded case of an action of tort being brought against a lunatic. If so, some proceedings in the Barton-on-Humber county court (recently reported by the *Law Journal*) are of exceptional interest. Tort, it is hardly necessary to explain, is the lawyer's label for a class of wrongs and breaches of duty which, when committed by one person, are legally harmful to another. Most of the actions in the law courts are framed either in tort or in contract; sometimes the same action has elements of both.

The Barton-on-Humber proceedings concerned the occupiers of two adjoining houses divided by a party wall. The occupier of No. 12 complained that the wife of the occupier of No. 11 banged continually on the wall night and day and for long periods at a time, and that she also screamed and shouted filthy and disgusting language. The result on the occupier of No. 12 was insomnia and nervous debility necessitating medical attention. No. 12 asked the county court judge to grant an injunction and damages against No. 11. The offender in No. 11 had been a certified lunatic; she suffered from chronic delusional insanity; a year ago she was an inmate of a mental hospital whence she was released upon her husband undertaking to look after her. Her husband was joined with her as co-defendant in the county court action because, by a feminist streak in our law, a husband is responsible for his wife's torts. But the husband here was not liable qua husband unless his wife was liable; if the wife was insane, could she be liable for a tort? According to a dictum of Lord Esher in Hanbury *v.* Hanbury (1892), if A does an act which, if done by a person of sound mind, would make him civilly or criminally responsible to the law, then, if the disease in A's mind is not so great as to make him unable to understand the nature and consequence of the act, that is an act for which A will be civilly or criminally responsible. This implies that lunatics are not entirely above the law. The county court judge drew a distinction between voluntary and involuntary actions. He held that the noise of the banging and screaming amounted to a nuisance in law; it was in fact a tort, an actionable wrong. If the woman knew she was doing the acts complained of, she was liable in damages. The judge held that, although insane, the woman knew she was doing an act which annoyed her neighbours. She was in part amenable to reason. Her husband had said "She stops when I tell her." There was evidence that on one occasion, after a letter from the plaintiff's solicitor had been read to her, she was quiet for a fortnight. She bangs, said the judge, because she thinks she is provoked; therefore she does realise what she is doing. Consequently she was legally liable for the nuisance she committed. As the husband had offered to leave the house and take his wife away elsewhere, the judge might have been reluctant to grant the remedy of an injunction because that remedy is not deemed appropriate if there is no threat or prospect of future and continued infringement of rights. As, however, the nuisance had now been going on for years, an injunction was granted and, in addition, damages to the amount of £5 were awarded.

Noise as an Actionable Wrong

The foregoing case must not be taken as indicating that all noise from neighbours is a nuisance in law. Judges have made it clear that people who live in towns must expect the kind of noise which is inseparable from collective life. A convenient summary of the law is to be found in the judgment of Luxmoore, J., in Vanderpant *v.* Mayfair Hotel Co. (1930), a case where a resident in Curzon-street complained of the noise arising at the hotel from shouting, loud talking, or the handling of kitchen or domestic utensils, milk churns and other articles—noise which reached a climax when the preparation of meals was in full swing. The judge observed that, apart from any right which may have been acquired against them by contract, grant, or prescription, people are entitled as against their neighbours to the comfortable and healthy enjoyment of the premises they occupy. In deciding whether, in a particular case, this right has been interfered with and a nuisance thereby caused, it is necessary to determine whether the act complained of is an inconvenience materially interfering with the ordinary physical comfort of human existence, not merely according to elegant or dainty modes and habits of living but according to plain and sober notions obtaining among English folk. It is also necessary to take into account the circumstances and character of the locality. If the noise is an actionable nuisance according to this standard, it is no answer to say that the best known means have been taken to reduce or prevent it, or that the cause of the nuisance is the exercise of a business or trade in a reasonable and proper manner. The question of the existence of a nuisance is one of degree, and depends on the circumstances of the case.

It might be added that if the ordinary law could adequately restrain the noise nuisance, it would not be necessary for particular localities to obtain special powers by local Act for controlling that nuisance. There must be plenty of medical practitioners who are aware, either by their own experience or by that of their patients, of the annoyance and the menace to health which noise can constitute.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE IRISH HOSPITALS' SWEEPSTAKES

THE second report of the Committee of Reference of the Irish Hospitals' Sweepstakes—that dealing with the Grand National Steeplechase of last March—contains criticisms of the claims of the several participating institutions, the allotment of funds as approved by the Minister for Justice, and also some general observations on hospital policy. The allotment of funds is on the same principle as in the first report, and the flaws then observed became more obvious with each additional distribution. The method followed is to consider each claim as presented, prune it of extravagances and unnecessary expenditure, and declare an "award" such as would be proper to make if unlimited funds were available. This "award" is a purely imaginary figure. It is next reduced by the sum already received from

previous sweepstakes by the institution concerned. The amount actually available is then distributed in proportion to the reduced "awards" so reached. This constitutes the real award. In the sweepstake under consideration the real award stands to the reduced imaginary award in the proportion of (in round figures) 1 to 14. Two flaws appear in this method. The deduction of the sum already received should be made from the real and not from the imaginary award. The principle adopted results in much larger sums proportionally being granted to the hospitals which have been participating for the longest periods. It neglects the actual present needs. In the second place, a percentage grant towards a scheme approved by the Committee may not in fact be of any help toward the carrying out of that scheme. For example, suppose that a building or development scheme to cost £100,000 be approved. But a grant of only £7000 is available. Clearly the full scheme cannot be undertaken on such a basis, and the grant may lie fallow or may have to be applied to some other purpose. These flaws would, of course, disappear if, during the lifetime of the sweepstakes, the total amount of the imaginary awards should become available, but only on this hypothesis. Moreover, neither the Committee of Reference nor the Minister has power to ensure that any particular grant should be used for the purpose for which it is given.

In its general observations the Committee of Reference pays special attention again to the lack of coördination between the several hospitals, and in particular in the case of children's hospitals. It is suggested that the several children's hospitals in Dublin should combine to form a joint central clinic. The Committee, while suggesting coördination and coöperation in both its reports, appears to be shy of discussing amalgamation; but the question cannot be avoided, and no doubt evidence on it will be put before the Hospitals Commission which is soon to be appointed to consider the whole question of hospitals in the Irish Free State.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following half-yearly promotions have been made: Surg. Comdrs. to be Surg. Capts.: W. H. Edgar, A. G. V. French, and H. E. R. Stephens.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. T. Turner to be Surg. Capt.
Surg. Lt.-Comdrs. T. W. Drummond and W. F. W. Betenson to be Surg. Comdrs.
Surg. Sub-Lt. K. E. L. Yuill to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

ARMY RESERVE OF OFFICERS

The undermentioned, having attained the age-limit of liability to recall, cease to belong to the Res. of Off.: Lt.-Cols. J. Fairbairn and R. R. Lewis.

TERRITORIAL ARMY

Lts. W. H. D. Patterson and B. Reid to be Capts.

INDIAN MEDICAL SERVICE

The prob. appt. of William Fleming as Lt. is confirmed.
Capt. P. S. Varadarajan relinquishes his temp. commn.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The 19th annual conference of this association will be held at Cardiff from July 13th to 15th. The address of the association is Tavistock House North, Tavistock-square, London, W.C.1.

NEW YEAR HONOURS

THE list of honours issued on Jan. 1st contains the names of the following members of the medical profession:—

Baron

Sir Thomas Jeeves Horder, Bt., K.C.V.O., F.R.C.P.
Senior physician to St. Bartholomew's Hospital; physician-in-ordinary to the Prince of Wales.

K.C.I.E.

Major-General John Wallace Dick Megaw, C.I.E., M.B., K.H.P.
Director-General of the Indian Medical Service.

K.C.V.O.

Frederic Jeune Willans, C.V.O., M.R.C.S.
Surgeon apothecary to H.M. Household at Sandringham.

Knights Bachelor

John Lawrance McKelvey, F.R.A.C.S.
Surgeon to the Royal Prince Alfred Hospital, Sydney.

San Crombie Po, C.B.E., M.D.
Medical practitioner and municipal commissioner, Bassein, Burma.

C.B.

Surgeon Rear-Admiral Herbert Reginald Harry Denny, M.R.C.S., R.N.

C.M.G.

Walter Burford Johnson, M.B., W.A.M.S.
Director of medical and sanitary service, Nigeria.

C.I.E.

Major-General William Charles Hughan Forster, M.B., V.H.S., I.M.S.
Surgeon-General with the Bombay Government.

Colonel John Norman Walker, M.R.C.P., I.M.S. retd.
Director of medical department, H.E.H. the Nizam's Government, Hyderabad, Deccan.

Lieut.-Colonel Robert Beresford Seymour Sewell, M.R.C.S., I.M.S.
Director of the Zoological Survey of India.

C.V.O.

William Hope Fowler, F.R.C.S. Edin.
Consulting radiologist to the Royal Infirmary, Edinburgh.

O.B.E. (Military)

Surgeon Commander William Harold Edgar, M.D. R.N.

O.B.E. (Civil)

John Thomas Bradley, M.D.
Chief medical officer, Seychelles.

Miss Charlotte Purnell, M.S.
Surgeon to the English Mission Hospital, Amman, Transjordania.

Eric Slack, M.B.
Medical officer, Leper Settlement, Botsabelo, Basutoland.

Robert Stanley Taylor, M.D.
Principal medical officer, Somaliland Protectorate.

Kaisar-i-Hind Medal

Miss Charlotte Rose Greenfield, M.B.
Medical officer in charge of St. Margaret's Hospital, Poona, Bombay.

Robert Harold Hull Goheen.
Medical missionary in charge of the American Presbyterian Mission Hospital, Vengurla, Bombay.

Rt. Rev. Kenneth William Stewart Kennedy, M.B.
Bishop of Chota Nagpur.

THE DOCTOR'S DAY

"Come, tell me how you live," I cried,
"And what it is you do!"

IX.—THE ANÆSTHETIST

COMPARED with other branches of practice the administration of anæsthetics has obvious advantages. One is that when the anæsthetist leaves after an operation his work is done as far as that patient is concerned; he has no worries about after-treatment or future welfare. It is true that some post-operative troubles are commonly attributed to the anæsthetic, but even so the anæsthetist's practical connexion with them is chiefly a matter of prevention. He is rarely called in to give help however much he may be made the scapegoat for its necessity. Again, the anæsthetist requires no consulting-room, so to say no shop-window. He is free to live where and as he pleases, so long as his home is not far from his base, and he can be reached at once on the telephone. Thus, provided he has someone to answer the telephone when he is out and capable of making appointments, a couple of rooms—even a good bed-sitting-room—suffice him. His expenses are far less than those of the general practitioner or of any other kind of specialist. His working-plant is no doubt a big item at the start, but to keep it in order and to supply the annual consumption of drugs, nitrous oxide, oxygen, ether, and the rest, is not a heavy burden. To practise in London he will not find a car essential; taxi-cabs are good enough. But it must be either London or some other large town; anyone who wants a country life must take up some other branch of medicine. He might perhaps live out of town if he decides to limit himself to dental anæsthetics which are required only in the day-time.

PROSPECT OF EARLY SUCCESS

An obvious advantage which the anæsthetist enjoys is that he begins to earn a fair income early in his career; he is not expected to look mature or even middle-aged. Many surgeons indeed prefer to work with an anæsthetist much younger than themselves so that they retain that sense of undisputed command and control of the entire proceedings which they think essential for the proper conduct of an operation. This advantage however of starting success early is counter-balanced by the disadvantage that an anæsthetist's work is likely to fall off comparatively early too. He is more apt to be displaced by the younger men than are workers in other branches. And this comes the harder on him as his emoluments are not high. With regard to this side of his work the anæsthetist's position is a little peculiar. Sometimes his fee is arranged by the surgeon, sometimes by the practitioner, and sometimes he is asked himself to name it. In the two former instances a common custom is for the anæsthetist's fee to be stated in terms of the surgeon's—10 per cent. as a rule. There is really no logical connexion between the two fees, and as time goes on and the true value of expert anæsthetists is more fully recognised he will more commonly be asked to state his own fee. It is obviously not easy for an anæsthetist in his active years, which are comparatively short, to save a sum sufficient to carry him on when his work is declining. It is partly no doubt for this reason that many men try to combine the career of an anæsthetist with that of a general practitioner. When their anæsthetic work falls off they have still the general practice on which to rely. Nevertheless this double life is not entirely satisfactory. The two kinds of duty often clash, and it is not easy to reach a good position in either career if both are attempted. Moreover, the tendency at the best hospitals now is to appoint as anæsthetists only those who are prepared to devote themselves entirely to this branch of work.

AN AVERAGE DAY

Let us glance at an average day in the life of a London anæsthetist attached to a teaching hospital and in the full bent of his career. At 9 A.M. he is at a nursing home to give an anæsthetic for a laparotomy performed by one of the surgeons with whom he is associated in hospital. At noon he gives gas-and-oxygen at a dentist's within a walk of his rooms, and at 12.45 P.M. another dental anæsthetic not far off. After a brief lunch he goes to hospital where he is giving anæsthetics and teaching students from 2–5 P.M. At 6 P.M. he gives an anæsthetic for an ear and throat surgeon. At 7 P.M. he pays a visit to a nursing home in order to examine a patient to whom he is to give an anæsthetic on the morrow and to decide about a preliminary injection. Some days he will have more to do than this, on others much less, and occasionally he will be wanted after dinner or at night for an emergency, an acute appendix or mastoid for example. Now and then his ordinary routine will be interrupted by a day with a maternity patient who desires to have no pain at all or has requested that an anæsthetist may be in attendance early during the confinement. Often it will happen that he receives invitations from two surgeons for the same hour, or so nearly the same that he is obliged to refuse one of them. And often it will happen that the case which he has been told will take "about half an hour" actually occupies from first to last an hour and a half. Those things make it difficult for a busy anæsthetist to arrange his work without ever being unpunctual.

HIS VARIED OUTFIT

The anæsthetist's job is nowadays not monotonous because there is such a variety of methods and drugs at his disposal. In the course of an afternoon he may be giving long gas-and-oxygen, open ether, endotracheal, gas-and-oxygen plus ether, and using spinal and regional methods. He cannot consider himself fully competent unless he can employ any one of these easily and successfully when a case demands it. Anæsthetics form no longer a narrow specialty; indeed the scope is so wide that already there are specialists within the specialty, one man for example making himself expert at endotracheal, another concentrating on spinal and regional injection. This wide choice has made more insistent the desirability of an interview between patient and anæsthetist before the operation, so that the anæsthetist can arrive at the correct decision. In hospital work this previous examination is rarely possible, and the anæsthetist must learn to make quick decisions just before operation. In private practice he is well-advised to see the patient the day or at least some hours before operation whenever this is possible, and it is remarkable how much this extra attention is appreciated. The sedative and encouraging effect of such a visit leaves the patient disposed towards a quiet entry into unconciousness.

An anæsthetist's position is peculiar in this that it is dual. He has relationship at the same time with his surgeon and with the patient and it may occur—although fortunately not often—that the line of action which he would choose in order best to please the one is not that which is for the greatest welfare of the other. What degree of anæsthesia is proper for a difficult abdominal operation? There are surgeons who insist on absolute relaxation, and there are patients in whom complete abolition of muscular tone involves grave risk. Here is a quandary to be solved only by the clear principle, to do what is believed to be in the best interests of the patient.

THE SAVOUR OF HIS CAREER

The anæsthetist's association with surgeons provides the savour of his career. Endowed with a modicum of tact and sense of humour he will derive a steady

source of enlightenment and amusement from the different behaviour, professional and social, of those with whom he is privileged to work. One surgeon prefers complete silence during an operation, another talks all the time and expects audible appreciation. The anæsthetist may get salutary lessons in self-control both from the operator who occasionally loses his temper and reviles him and others, and from the surgeon who remains placid and efficient when everything appears to be going wrong. In private the anæsthetist learns diplomacy at interviews with patients' friends, and how to inspire confidence without forsaking veracity. He will not too rarely derive comfort from the surgeon's reference to the "excellent anæsthetic which Mr. A. administered." He will know how to work with those who follow every verbal appointment with a written confirmation and others who invite him to give an anæsthetic at a time and place to which a colleague has already been bidden.

It is open to any man of average attainment to become a first-rate anæsthetist if in addition to all else he is possessed of one additional quality—namely, nerve. The man who is easily perturbed and thrown off his balance can never succeed in this branch of work, for he will be confronted at times with a patient whose condition, suddenly and unexpectedly, becomes critical. His duty is then at once, without causing alarm or confusion, to see that all steps are taken to bring about recovery. There is nothing more harassing to the surgeon than an anæsthetist who is forever becoming needlessly alarmed, and nothing more dangerous than one who is not alive to the indications of approaching trouble. One other virtue is essential if he is to be acceptable to surgeons, and that is punctuality. He must never keep his surgeon waiting, and it is one of the chief difficulties with which he has to contend that surgeons are apt to prefer the same hour. It needs some strength of mind to refuse a case rather than run the risk of being late for it, but the anæsthetist who makes sacrifices in order to maintain punctuality will be repaid in the long run.

Outside his practical work he can find plenty of professional interest. There are problems of physiology and of psychology constantly arising in his daily work, and if he can make time and opportunity to seek the solution of these problems by experimental work he will add greatly to the attractions of his occupation. He will want to keep his knowledge abreast of the times by studying the periodic literature of his own and other countries. The man who is starting his career as an anæsthetist may, I think, face the future with a light heart for his work is young, as such things go, and there is plenty of development still ahead. Finality and perfection are far from having been reached in the practice of anæsthetics. He can have a full and interesting life, even if he is engaged on a career which has been well described as "honourable, but not fertile."

PUBLIC HEALTH SERVICES

Public Health in the Local Acts of 1931–32

THE newly issued official Index to the Local and Private Acts [1] for the session 1931–32 has to deal with 97 Acts as against 112 in the previous session. The policy of economy must have reduced the activity of local authorities in seeking fresh powers from Parliament. Except for the Bury Corporation Act there is hardly an instance of any large-scale advance in a local code of public health. As usual, the recurrence of familiar provisions—for example, the power to close Sunday schools during epidemics—makes one wonder why Parliament is so slow to enact in a general Public Health Act many well-established common-form clauses which an individual local authority has now to pay to obtain in an Act of its own. Some Local Acts are due to a desire to alter existing rights as when St. Andrews wants power to charge a fee for admission to the golf links during championships. In the main the Local Acts represent progressive stages in eluding the restrictive influence of the district auditor and the doctrine of *ultra vires*. Though it may be a legal person, a local authority has no powers which it has not been expressly given. Does a town like Bury want to spend money on an aerodrome or on educational lectures or on pictures for its art gallery? These activities, deemed by some desirable, by others extravagant, are outside its scope until Parliament gives permission. Some local bodies set the pace for others; gradually the new powers are tested by experience and are adopted elsewhere if found successful. The following summary, as in previous years, endeavours to specify novel clauses likely to serve as precedents.

To begin with the subject of food, the London County Council breaks fresh ground. An existing provision for inspection and destruction of unsound meat, &c., is extended to animals or articles of food and drink offered as prizes at entertainments or given away under advertisement schemes or otherwise. London, Bury, and Rochdale have fresh requirements for compulsory notification of food poisoning. There are various familiar clauses for restricting the handling of food by infected persons, for registering makers and premises in respect of ice-cream or potted meat, and for the general regulation of food preparation, storage, and transport. Dundee has power to restrict the conveyance of meat in open vehicles; this power seems new in Scotland. The Bury clauses as to street vendors of food, inspection of vehicles, and precautions against contamination where food is prepared in yards follow previous precedents, but there seems to be a new safety provision requiring fire-extinguishing apparatus to be available where heated or boiling fat or oil is extensively used in cooking fish or potatoes. Again, as regards infectious disease, the Bury Act (Part VIII.) includes several well-tried provisions as to the supply of antidotes, the removal of dead bodies and the disinfection of conveyances used for carrying them, tuberculosis disinfection, powers of keeping children away from Sunday schools and entertainments, entry into premises where there is dangerous infectious disease, obtaining laundrymen's names, compulsory information "for the purpose of enabling means to be taken to prevent the spread of the disease," notification of pulmonary tuberculosis, and power to demolish stables or cowsheds when the medical officer certifies the presence of infectious or parasitic disease. A few of these clauses also appear in the Welwyn Garden City Act.

In respect of housing and building law the Bury corporation seems to have struck out a new line by prohibiting the construction of cellars or rooms belonging to dwelling-houses where the floor level will be below the highest known level of subsoil water. It also restricts the erection of dwelling-houses on land which is either liable to flooding or unsuitable by reason of the nature of the subsoil. With an unhappy experience of the danger of floods to houses and their occupants, the London County

[1] H.M. Stationery Office. 1*s*. 6*d*.

Council has taken new powers to maintain automatic tide gauges and to give warnings of high tides in the Thames. Rochdale, Blackpool, and Wolverhampton have elaborated their powers of regulating buildings, though not all have so large a scope for by-laws as at Bury, where the corporation may regulate the number of houses in one block or row, the intervening spaces, height of walls or fences, testing of drains, adequate flushing of closets and protection of their pipes from frost, fixed baths, ventilation of geysers. Bury has also the usual provision as to food storage accommodation in existing and future dwelling-houses (ventilated pantry and other facilities). Provisions which perhaps affect amenities more than health include the Edinburgh restriction on "ribbon" building development along roads (Surrey furnished a precedent for this last year) and the Bury clause for removing dilapidated and neglected buildings which are "in a structural condition prejudicial to property in, or the inhabitants of, the neighbourhood." There is a novel clause in the Edinburgh Act for requiring repainting or redecoration of exteriors. Cities like Bath, which have panoramic assets to be destroyed, will doubtless note this attention to colour-schemes. A wide range of clauses controlling the lay-out of land and the erection of temporary structures occurs in the Lindsey County Council (Sandhills) Act, where doubts about the ownership of the Sandhills and the power to enclose or build have been solved in special circumstances. The Act recites that many buildings "are unsightly or otherwise of an undesirable character . . . and are not provided with a proper water-supply or sanitary conveniences." Fresh provision for regulating life in tents, vans, and shacks is made at Rochdale, Welwyn, Bury, Cambridge, and Clydebank. Dundee has provided for an equalisation fund for slum clearance. At Birkenhead abandoned drains must be filled in, and persons constructing new streets may be required to provide separate sewers for sewage and for surface water.

There is less than usual of interest to the medical profession in the miscellaneous contents of the Local Acts of 1931–32. Three clauses in the Bury Act deal with nuisances encountered in town life. The nuisance of noise is added to the nuisances in the Public Health Act and is dealt with as in precedents in which Edinburgh led the way in 1930. The ejection of steam or waste gas to the annoyance of the public is prohibited. Silencers must be fitted to stationary internal combustion engines. In all three cases there is a saving for railway companies. The nuisance of dogs fouling pavements is dealt with at Edinburgh; experience elsewhere shows that this statutory provision has more value as a warning notice than in actual enforcement by penalty. An illustration of the local variety of criminal offences is the regulation at Dundee of writing or chalking on carriage-ways. Rochdale follows former precedents in restricting the sorting of the contents of ashbins. Welwyn and Bury can now require owners or occupiers of houses or shops to provide portable dust-bins. Bury has gained the power, novel until a few years ago, to remove to an infirmary any person who is aged or infirm or physically incapacitated and who lives in insanitary premises or anyone who is suffering from grave chronic disease and is not properly looked after The not uncommon precautions against plumbism appear in the Chesterfield and Bolsover Water Act. Birkenhead is now authorised to construct, equip, and manage "medicated and other baths, including baths the efficient properties of which are due to agencies other than water." To conclude this list of miscellaneous items, mention may be made of the special superannuation clause for the medical officer in charge of mental services in Edinburgh and the variation of the charitable trust of Epsom College, once known as the Royal Medical Benevolent College. The R.S.P.C.A. is incorporated by a special Act; one of the functions of its council is "to arrange for the proper conduct of punitive, persuasive, educational, Parliamentary, and all other operations."

As regards the form and draftsmanship of the Local Acts, there are two instances of successful consolidation —the Edinburgh Act and the Thames Conservancy Act. The latter contains wide powers for controlling the passing of sewage, refuse, oil, and tar into the river, and for regulating the sanitary arrangements of vessels and the general navigation of the upper Thames with special care for its bird life, its fish, and its amenities. Most of these clauses are an improved restatement of the effect of former statutes. The London County Council, which is credited with most laudable ambitions in the direction of rewriting the various laws by which its administration is carried on, has no fresh instalment in the past session. It has already consolidated the London Building Acts and is understood to be applying the same admirable effort to the various Public Health (London) Acts. The result may appear next session. It would be an object-lesson to Parliament to rewrite in orderly form the Public Health Acts applicable to the country as a whole.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 24TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 16 (last week 28); scarlet fever, 2005; diphtheria, 882; enteric fever, 36; acute pneumonia (primary or influenzal), 1721; puerperal fever, 38; puerperal pyrexia, 94; cerebro-spinal fever, 26; acute poliomyelitis, 8; acute polio-encephalitis, 1; encephalitis lethargica, 6; dysentery, 4; ophthalmia neonatorum, 61. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 27th–28th was as follows:—Small-pox, 63 under treatment, 0 under observation (last week 67 and 1 respectively); scarlet fever, 1852; diphtheria, 1696; enteric fever, 12; measles, 251; whooping-cough, 440; puerperal fever, 21 (plus 8 babies); encephalitis lethargica, 228; poliomyelitis, 5; "other diseases," 183. At St. Margaret's Hospital there were 11 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 24 (0) from measles, 11 (1) from scarlet fever, 20 (8) from whooping-cough, 25 (4) from diphtheria, 50 (11) from diarrhœa and enteritis under two years, and 120 (8) from influenza. The figures in parentheses are those for London itself.

Bristol and Poole each reported 1 death from enteric fever. Measles caused 5 deaths at Liverpool, and 4 at Birmingham. Four fatal cases of diphtheria occurred at Hull. Fatal cases of influenza were reported from 40 great towns, the largest number of deaths being 30 at Birmingham, 9 at Sunderland, 8 at Liverpool, 5 each at Newcastle-on-Tyne and South Shields. In the same week Glasgow reported 86 deaths from influenza and 15 from whooping-cough.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 47 per 1000 total births), including 42 in London.

PANEL AND CONTRACT PRACTICE

The Out-patient Inquiry

A FIRST impression on the report of the committee appointed to inquire into out-patient methods is that most of the conclusions and recommendations are sound enough from a general practitioner's point of view, though it is regrettable that no practitioner joined in their deliberations. The committee state that it is highly desirable that in any plans for the organisation of the medical service of the community the sympathy of practitioners as well as of the hospital staff should be secured. With regard to panel practitioners, some evidence was given—we are not told by whom—that conditions of insurance practice do not make for efficiency, and that panel doctors do not give adequate time and attention to their patients, having too many of them. On the other hand, some hospital consultants, giving evidence on behalf of the B.M.A., said that all their experience showed that the great bulk of panel practice was carried out honestly and with very great skill, and they did not think that hospitals need do the work of the panel doctors for them. The committee say that the representatives of the London public medical service made out a strong prima facie case for the proposal that hospitals should refer patients to the public medical service for the treatment of minor ailments. It is suggested that, as a check on practitioners referring unsuitable cases to hospitals, each hospital should keep a record of patients referred by each panel doctor; if any doctor is found to be sending up a disproportionately large number of cases—especially if his forms were badly filled in—he should be reported to the panel committee to be dealt with.

Much evidence has been taken, some of it being mutually contradictory. The committee appear to have sought a middle way in their suggestions for solving the more important issues, such as whether a hospital should throw its doors open to everyone or offer a purely consultative service. They consider that the movement towards more consultative use of facilities is in the right direction, but that it should be possible for patients who desire a second opinion to have access to hospitals without having first to obtain sanction from a practitioner. It would indeed be difficult to refuse to see anyone who comes to hospital complaining of being ill and goes to the casualty department. One examination and one treatment is often all that is required by such a patient, but this hardly applies to out-patient attendance. The condition laid down for such attendance is inability to pay consultant fees. Nothing is said about practitioners' fees, and this is perhaps a weak spot in the report, for it implies that consultants are to be protected from loss of fees by the use of the out-patient department, but not general practitioners. The committee may be criticised for a ruling which will bolster up the whim of a patient who imagines that his own doctor cannot look after him properly, while failing to protect that doctor from loss of fees. But all will welcome the encouragement of coöperation with other agencies in the disposal of patients not suitable for enrolment as out-patients, the hospital almoner providing a valuable part of the machinery for such coöperation. Standard hospital letters are advocated.

On the question of the time spent by patients in waiting, it is pointed out that a few minutes saved by up-to-date methods for dealing with each patient in a queue makes a great difference to those at the end of the queue. For example, registration by a modern system of filing and indexing saves much time. A certain amount of waiting is inevitable, but alteration of times of attendance for old patients or groups of patients, and sometimes structural alteration can materially lessen the waiting period. Some striking instances are given in the report of minor alterations in procedure or structure which have greatly diminished waiting periods. An interesting piece of evidence was that those hospitals which by adopting new methods had reduced the waiting period, in this way attracted more patients, and overcrowding soon became re-established. In this matter of waiting the committee say "it is the consultant the patient wants to see and for whom he is willing to put up with long waiting without complaining."

The investigation of complaints elicited a statement from one witness that it is not to the advantage of a patient to become known to the hospitals as a complainer. It is agreed that complaints are not numerous.

The figures of 12 teaching hospitals show that in 1931 there were 125,000 less out-patients than in 1911, but 1,160,000 more attendances, indicating that more serious cases were being dealt with. The Hospital Saving Committee say in their evidence "one thing is common to all the hospitals—they have the confidence of the working-class population."

Psychotherapy under the Act

The position of psychotherapy under the National Health Insurance Act was carried one stage further at the last meeting of the London insurance committee when there took place a full dress debate on the question as to whether this was a treatment for which it would be legitimate for an insurance practitioner to charge fees to an insured person. It will be remembered that the Local Medical Committee for London held the view that this was a specialty which should be regarded as outside the Act; the medical benefit subcommittee of the London insurance committee thought otherwise, and on Dec. 22nd the full insurance committee for London confirmed the medical benefit subcommittee's view. Dr. Gregg led the attack against this opinion that psychotherapy should be included among the ordinary services of a practitioner to his panel patients. He asserted that the real reason underlying the unwillingness to acknowledge claims for special fees for psychotherapy was that members of the medical benefit subcommittee viewed psychotherapy with suspicion. It was, however, a definite specialty, the doctor claiming fees in the four cases on which the matter had arisen had satisfied the regulation as to his qualifications, and therefore whether the committee liked it or not they ought to pass these claims. Dr. Chase agreed that psychotherapy was a specialty and that the panel practitioner in question had the necessary qualifications, but considered that skill in psychotherapy corresponded to a high degree of specialism on the medical side of practice, such as the special treatment of diabetes, or pneumonia, or some nervous diseases. The treatment of such medical cases would not, he thought, for one moment be considered outside the scope of the Act, and yet they often involved specialist work. Whilst the treatment of diabetes would not be considered outside the Act, the moment manual dexterity was involved,

such as the estimation of the blood-sugar of such a patient, both committees would agree that a charge could be made. No manual dexterity was involved in the treatment of a patient by psychotherapy, and he thought the specialty was not one for which it would be proper to charge an insured person. He held that it was obviously better to let the Ministry of Health decide the point. Miss Samuel held that nothing should be done to prevent the poor from obtaining benefits available to the rich and that the committee should do nothing to discourage the psychotherapist. Dr. Cardale spoke strongly in favour of psychotherapy being placed outside the Act, since it was now recognised everywhere as a definite specialty. Mr. T. B. Layton pointed out that the tendency of modern medical education was to give students some knowledge of every branch of medicine. Psychotherapy was not a new subject and all practitioners employed it either knowingly or unknowingly in the treatment of their patients.

The debate was continued by other speakers, till finally Mr. Spearing, the chairman of the medical benefit subcommittee, pointed out that automatically the decision to refuse payment for fees claimed for this "specialty work" made it obligatory on the Ministry to appoint a court of referees to decide the question. He did not think that it should be left to patients, needing any form of treatment, to decide whether they should go to some hospital where they would not be charged for it or whether they should pay a doctor, who hoped to cure them by this treatment, but required a fee for it. It was the duty of the committee to protect the insured person against the unscrupulous doctor. After all, the fact that he could not charge his insured person for this treatment need not prevent the doctor from giving the treatment if he was so certain that it would do good.

CORRESPONDENCE

GASTROSTOMY VERSUS INTUBATION

To the Editor of THE LANCET

SIR,—In your issue of Dec. 31st (p. 1434) Mr. Hugh Donovan makes a very moderate plea in favour of gastrostomy in cases of carcinoma of the œsophagus. The condition, practically always fatal, is regrettably frequent; many of us have at one time or another to advise a patient as to the best prospects of relief. I am prompted to offer in tabular form the pros and cons of gastrostomy and intubation.

GASTROSTOMY: *Advantages.*—(1) The operation requires no special preparation, equipment, or technical experience, but can be performed by anyone accustomed to abdominal surgery; and, if necessary, under local anæsthesia.

(2) Once a gastrostomy has been performed nutrition is assured; further surgical treatment is seldom needed. But a gastrostomy is not necessarily permanent, and can be closed if the need has passed.

(3) It is applicable to all types of stricture, and is the *only* method available where a bougie cannot be passed through the stricture.

(4) The growth is relieved from irritation, and some improvement in swallowing occasionally follows.

Disadvantages.—(1) Food is not taken by the natural channel, and is not tasted. The psychic effect, when the patient realises that he will never taste or swallow anything again, is often very bad.

(2) Swallowing even of saliva may be impossible, with resultant distress and choking from overflow into the trachea; it is not easy to nurse a gastrostomy patient in the prone or semi-prone position. (Salivation is often a prominent symptom.)

(3) With rare exceptions, only sedentary work is possible.

(4) The majority of hospital-class patients are unable to make their own arrangements for feeding, care of the fistula, &c., and so the few remaining months of life must be passed in an institution.

(5) The immediate mortality is considerable.

INTUBATION (e.g., with Souttar's tube): *Advantages.*—(1) The patient is hardly conscious of disability; he can carry out even hard manual labour, as long as his strength allows; he takes his food and drink by the natural channels, and is not bothered by saliva; the necessary modifications of diet are within the capacity of any working-class home.

(2) Intubation is readily combined with radium or radon treatment.

(3) The immediate mortality is low (? 2–3 per cent.).

Disadvantages.—(1) Special equipment and training are necessary; the greatest care and gentleness are required in dealing with the diseased gullet; a general anæsthetic or basal narcosis is usually required.

(2) Occasionally an indiscretion in diet may lead to the tube being blocked. The tube may become displaced; in experienced hands this is rare, except with a soft growth through which the tube gradually passes. Further endoscopic treatment becomes necessary.

(3) The position of the growth (e.g., at the cardia) may render it unfavourable for intubation; it may be impossible to pass a bougie through the stricture or to dilate it sufficiently to admit a tube.

Either method may be combined with deep X ray or with chemotherapeutic treatment. Whichever is adopted, one class of patient presents a very bad risk—namely, those suffering from actual water-starvation; before anything is done, measures must be taken to remedy this, and when that has been achieved, I believe intubation to be much less risky than gastrostomy. Every case must be considered on its own merits; but in general the advantages of intubation are so great, and its disadvantages so much less serious than those of gastrostomy, that this method will be preferred.

I am, Sir, yours faithfully,

E. WATSON-WILLIAMS.

Clifton, Bristol, Dec. 31st, 1932.

To the Editor of THE LANCET

SIR,—Mr. Donovan gives the records of an important research into the operative mortality-rate, average length of stay in hospital, and the duration of life after operation in a series of 47 cases of carcinoma of the œsophagus which were subjected to gastrostomy. He states that "a consideration of these results does not encourage one to advise this operation strongly"; he is impressed by the observation "that a patient has a more comfortable end when he has a gastrostomy," and that "repeated intra-œsophageal instrumentation is very distressing to some old patients." Without wishing to detract in any way from the value of the facts set forth in

his article, I think that these three quotations all require some modification.

All laryngologists and many surgeons are agreed that œsophagoscopy should be performed in all cases of suspected carcinoma of the œsophagus, unless the patient arrives with absolute obstruction in an extreme state of food and water starvation. Œsophagoscopy can be carried out under local or general anæsthesia—as the patient desires—and gives rise to very little discomfort. It is the one certain means of arriving at a diagnosis during life. Other clinical methods, including radiography, are inferential only; and by the omission of œsophagoscopy the opportunity of adequate treatment of an early, and possibly curable, neoplasm of the œsophagus may be missed.

Provided that the operator is prepared to carry on at the time of the œsophagoscopy with intubation or the insertion of radon or radium, "frequent intra-œsophageal instrumentation" is rarely necessary. In fact the one procedure is often all that is required, as subsequent progress can be checked by X ray examination. A comparison of the relative comfort of a patient who is fed through and dies with a gastrostomy tube, and one who can swallow and die swallowing after œsophageal intubation or intra-œsophageal radium treatment, can leave no doubt as to the less unhappy state of the latter. There is, of course, a residue of cases which are unsuitable for endo-œsophageal treatment, and in these cases gastrostomy should be strongly advised. To one who has had the misfortune to watch a patient with absolute obstruction clamouring for drink and dying of starvation, realisation comes that this unnecessary suffering would have been avoided had the patient been handed over to a surgeon's care for gastrostomy, even at the risk of an operative death.

In a small series of 33 cases of carcinoma of the œsophagus seen by me during the past two years, 11 were treated by intubation and 17 with radon or radium. The number is too small to allow of sweeping conclusions, but it may possess some value because the treatment and follow-up have been carried out by one person.

Of the intubated cases four died as a result of operation. The average duration of life of the remainder after intubation was 4½ months, and these patients all died able to swallow. Of the 17 cases treated with radon, or radium, four are too recent to include. Two patients died in hospital; the average duration of life of the remainder after treatment was 9½ months. Two are still alive—one after 13 months, and he is gaining weight, and another after 17 months, who refuses to leave his work to come to hospital for examination. Two of the patients who died subsequently suffered from a recurrence of obstruction, one after nine months—she had a gastrostomy performed at another hospital—and the other after three months, who unfortunately received no such treatment and died a horrible death. Several of these 28 patients had one œsophagoscopic examination only, the majority two, and not one more than four "intra-œsophageal instrumentations." These figures make slightly less discouraging reading than those following gastrostomy alone.

Mr. Donovan points out that there is a sharp difference of opinion as to whether gastrostomy is worth while in cases of carcinoma of the œsophagus. Prof. Grey Turner has said "the attitude to palliative measures seems largely a question of temperament, and as much the temperament of the surgeon as of the patient." It would appear to me that a via media should be adopted. Cases of carcinoma of the œsophagus should first of all be submitted to œsophagoscopy. If after such examination it is considered possible to apply treatment endoscopically this should be carried out. If this is inadvisable, then gastrostomy should be performed as early as possible before the patient begins to complain of hunger.

I am, Sir, yours faithfully,

Liverpool, Jan. 2nd, 1933. JOHN E. G. MCGIBBON.

EPSOM COLLEGE: MUSEUM OF BIOLOGY

To the Editor of THE LANCET

SIR,—The following list of mammals needed for the museum will, I hope, prove of interest to your readers. The specimens enumerated below are specially required, but we should welcome offers of mounted specimens or skins of any mammals. Limitations of space and the educational purpose of the museum compel selection, and I would intimate at once whether or no any such offers could be taken advantage of. So many gifts of heads of big game have already been made that it is impossible to accommodate more.

Monotremata.—Ornithorhynchus.
Marsupialia.—Opossum, kangaroo, phalanger, wombat.
Insectivora.—Hedgehog, mole, tree-shrew, or any fairly large example.
Primates.—Apes, monkeys, lemurs.
Edentata.—Sloth, armadillo, anteater.
Dermoptera.—Galeopithecus, the "flying lemur."
Sirenia.—Dugong, Manatee.
Rodentia.—Porcupine, hare or rabbit, squirrel, hamster, lemming, beaver, muskrat, capybara, &c.
Carnivora, pinnipedia.—Seal.
Cetacea.—A small porpoise.
Ungulata.—Any small deer or antelope; hyrax.

I am, Sir, yours faithfully,

A. E. ELLIS,
The College, Epsom, Surrey, Dec. 31st, 1932. Curator.

ANÆSTHESIA FOR ACUTE INTESTINAL OBSTRUCTION

To the Editor of THE LANCET

SIR,—In Dr. Robson's article in your last issue the two-tube insufflation method of endotracheal anæsthesia is advocated, but no mention is made of gauze packing. Might I suggest that it is practically impossible to fill the glottis *completely* with two tubes without risk of trauma? A simpler method is to pass one soft rubber tube (or, if preferred, a semi-rigid open-ended catheter) which just fills the glottis comfortably. Gauze moistened with a weak antiseptic solution or with liquid paraffin is then carefully packed round the tube, which is connected either to an intermittent-flow gas-oxygen apparatus, or to a continuous-flow one with rebreathing bag and expiratory valve. If desired, the pack can be avoided by using Waters's pneumatic collar, which is attached to the catheter and passed with it in a deflated condition through the glottis. On inflation from a 10 c.cm. syringe a water-tight seal is obtained. Animals anæsthetised with this technique have been completely immersed in a water tank for considerable periods, showing that it is impossible for any fluid to get into the trachea.

A further advantage of the inhalation endotracheal method over the insufflation one is that much less ether is required and it is frequently possible to perform the operation under pure nitrous oxide-

oxygen to the great benefit of the patient. In general practice where no gas-oxygen apparatus is available, it is still possible to use this method with open ether, regarding the proximal end of the catheter as the end of an artificial airway.

I am in entire agreement with Dr. Robson as to the advantages derived from maintaining a stomach-tube in position during the operation.

I am, Sir, yours faithfully,
C. LANGTON HEWER.

Queen's-road, N.W., Jan. 3rd, 1933.

ARSENIURETTED HYDROGEN POISONING

To the Editor of THE LANCET

SIR,—Since I am the certifying surgeon to the works at which the two cases reported by Dr. R. R. Bomford and Dr. Donald Hunter (Dec. 31st, p. 1446) occurred, I may perhaps be allowed to add a few remarks to their excellent article.

The necessity of the early diagnosis of such cases is rightly stressed, but it should be noted that the official duties of certifying surgeons provide only for the periodic examination of workmen employed in certain dangerous trades, and do not include the immediate examination of men who may be taken ill between those visits. Had it not been for the enlightened action of the firm in question in making voluntary arrangements extending the certifying surgeon's official duties, this outbreak might have assumed more serious proportions. Thus I was enabled to see the first of these men as soon as it was known that he was ill, to suggest his immediate removal to the London Hospital for biochemical investigation, to visit the factory and advise the analysis of the dross, and to keep the other men who had been working near under observation. It is not the duty of the certifying surgeon, but of the doctor who is treating the case, to notify it to the Home Office; and since this doctor probably has no special experience of industrial disease and has not free access to the works at which his patient has been employed, it is not unlikely that cases may be missed.

The two cases now reported, together with two others which occurred some years ago, show the great diversity in the physical signs and in the severity of the poisoning which may follow inhalation of arseniuretted hydrogen. The man, A. B., when seen by me on the day following exposure was evidently seriously ill; he was deeply jaundiced; the urine obtained at this early visit contained free hæmoglobin, confirmed by spectroscopic examination, and arsenic was later found in it (by Dr. A. T. Fuller, biochemist to Queen Charlotte's Hospital) to the extent of 0·5 mg. per 100 c.cm. C. D. was kept under observation until June 7th—that is, 14 days after exposure; during that time he felt in his usual health and showed no physical signs on ordinary clinical examination. He then developed an illness which appeared clinically to be a slight attack of lead poisoning. Some years ago I was asked to visit a man working for the same firm who had been sent home seriously ill. I found him lying in bed semi-conscious, with a spastic condition of all limbs and increased deep reflexes. The urine was normal and there was no jaundice. I was unable to obtain any history and was puzzled as to what he was suffering from, but hearing that his mate was also ill and had been admitted to the London Hospital I went there. On arrival I found the visiting physician giving a clinical lecture upon the case as one of paroxysmal hæmoglobinuria. The presence of hæmoglobin in the urine gave the required hint, and on visiting the factory I found that both men had been treating zinc with hydrochloric acid, and had been suddenly overcome with the fumes. Analysis showed the presence of arsenic which had been given off in the form of arseniuretted hydrogen. The case at the London Hospital was not reported, but I believe arsenic was subsequently found in the urine.

These cases suggest that the certifying surgeon should take a wider view of his duties than is contemplated in the regulations; at present this is only possible in those firms which take a deep interest in the health of their employees.

I am, Sir, yours faithfully,
W. H. F. OXLEY.

Poplar, Jan. 1st, 1933.

TROPICAL ULCER

To the Editor of THE LANCET

SIR,—The paper of Dr. L. J. A. Loewenthal on Tropical Ulcer as a Deficiency Disease (THE LANCET, Oct. 22nd, p. 889) and that of Dr. Clifford James on Excision and Skin Graft for the same condition (Ibid., Nov. 19th, p. 1095), together with your annotation on p. 1121 of the same number, focus attention on this important cause of disablement in the tropics. With a view to supplementing the information given in these communications, I venture to submit references to investigations carried out in Kenya Colony. It is difficult to keep touch with the literature of even so limited a subject, but I trust that others having experience to record may find the following of service.

The researches of Dr. J. B. Orr, F.R.S., of the Rowett Institute, and Dr. J. L. Gilks, F.R.C.S., Director of Medical and Sanitary Services in Kenya, on the Nutrition of African Tribes, will be found in Special Report No. 155 of the Medical Research Council. This investigation, undertaken at the instance of the Economic Advisory Committee, paid special attention to ulcus tropicum and its possible relationship to nutrition. Numerous references are given to previous work. Dr. Loewenthal will also find that on several occasions Dr. Harvey, of the research laboratory at Nairobi, has made communications on calcium metabolism in the *Kenya and East African* (now *East African*) *Medical Journal*. In the same journal there have appeared the following special contributions on the subject of tropical ulcer and its treatment:

Fisher, V., vol. i., p. 295, on labour employed in railway construction.

Procter, R. A. W., vol. vii., p. 276, on the same subject.

Harley-Mason, R. J., vol. iv., p. 350.

McNabb, J., vol. vii., p. 216, on labourers in Magadi Soda work.

Brennan, C. H., vol. vii., p. 203, on excision and grafting.

Anderson, T. F., and Roberts, M. W., vol. ix., p. 79. Excision and grafting. Records of 154 cases. Length of residence after grafting averaged 19·6 days.

Enzer, J., vol. ix., p. 148. Record of 112 cases treated by excision and grafting. Similar rapid results.

Esler, A. R., vol. viii., p. 176, and ix., p. 237. Treatment by strapping after Dickson Wright's method.

McLean, N., vol. ix., p. 272. Treatment by strapping

Dr. Loewenthal also contributed a paper to the same journal (vol. ix., p. 136) based upon the facts and figures published later in THE LANCET.

I am, Sir, yours faithfully,
JAMES H. SEQUEIRA.

Makuyu, Kenya.

SEAHAM HALL TUBERCULOSIS SANATORIUM.—A new wing and nurses' home of this institution, which have cost nearly £25,000, was formally opened on Dec. 17th. The extensions provide accommodation for 50 additional patients, and it is hoped so to reduce the waiting-list of 91 women and 24 girls that it will no longer be necessary to send patients outside Durham county. Seaham Hall was given to the Durham county council by Lord Londonderry in 1928, and was opened with 28 beds.

MEDICAL NEWS

University of Oxford

On Dec. 17th the following degrees were conferred:—

D.M.—A. J. Gibbs.

B.M.—J. R. Robertson, R. F. Woolmer, W. H. Owles, H. B. Morris, R. C. MacKeith, R. A. Beaver, J. E. Jenkins, A. J. Grace, and N. P. Bruce.

University of Cambridge

At recent examinations the following were successful:—

THIRD EXAMINATION FOR M.B. AND B.CHIR.

Part I., Surgery, Midwifery, and Gynæcology.—J. C. G. Anderton, E. F. Baines, H. Barcroft, G. F. Barran, C. G. Batty-Smith, W. T. C. Berry, C. E. Bevan, E. V. Bevan, R. W. Billington, G. O. Brooks, R. H. Brown, J. R. Chambers, A. H. Charles, F. H. Coleman, J. Collinson, P. T. Cooper, A. G. Cross, H. S. Davis, L. W. B. Dobbin, J. R. Duffield, D. K. Emery, W. G. Evans, A. A. G. Flemming, P. H. R. Ghey, P. R. Goodfellow, R. W. Graham-Campbell, S. J. Hadfield, B. P. Harris, F. G. Hinks, M. I. A. Hunter, T. B. Jones, A. H. Knowles, D. Kyle, R. C. Langford, C. A. Lewis, W. Lewis, T. E. S. Lloyd, M. W. Lloyd Owen, K. Lumsden, F. D. MacCarthy, A. B. MacGregor, W. S. McKenzie, F. G. Maitland, T. C. Maling, G. J. H. Maud, J. W. Maycock, M. P. Morel, C. W. Morley, H. J. V. Morton, T. P. Mulcahy, J. P. S. Peck, K. M. A. Perry, F. W. J. Platts, J. S. M. Pringle, S. A. Propert, P. J. Richards, W. F. Richards, F. Ridehalgh, I. G. Robin, K. Robson, G. Scott, E. P. Sharpey-Schafer, D. W. Smithers, J. G. C. Spencer, T. V. Tattersall, A. C. Taylor, E. W. Taylor, H. B. Tipler, G. E. H. Tisdall, G. I. Watson, W. E. Wells, C. J. G. White, A. Willcox, J. Wilson, and R. M. Yeo.

Part II., Physic, Pathology, and Pharmacology.—S. E. Birdsall, C. P. F. Boulden, A. Bowen-Davies, E. Bradbury, W. D. Brown, J. W. Campbell, C. A. Clarke, F. J. Curtis, S. F. L. Dahne, W. D. Dick, L. W. B. Dobbin, P. M. Dobbs, R. H. Dobbs, J. C. Drury, G. A. Emmerson, R. H. Foster, D. W. C. Gawne, W. G. Gill, C. A. Grove, G. W. Hall-Smith, E. R. Hargreaves, B. P. Harris, J. Howell, N. M. James, H. V. Knight, A. R. R. Le Fleming, R. S. Lewis, G. A. Mandow, A. R. R. Mears, D. A. Metcalf, G. A. Miller, F. H. Morrell, J. Parkes, E. B. Pawson, R. V. Payne, K. M. A. Perry, R. G. Pulvertaft, C. G. Roberts, R. D. Roper, F. W. Shepherd, S. K. K. Sze, C. W. Thomas, C. B. M. Warren, J. G. Warren, G. D. Wedd, H. D. White, G. A. W. Whitfield, and W. Wilson.

University of London

At a recent examination the following were successful:—

M.S.

Branch I. (Surgery).—O. V. Lloyd-Davies and E. G. Muir (University Medal), Middlesex Hosp.

Forthcoming Lectures.—Six lectures on Factors in Nutrition will be given in the physiological department of Bedford College, Regent's Park, N.W., by Prof. S. J. Cowell, at 5 P.M. on Wednesdays from Jan. 11th to Feb. 15th inclusive. At the same time on Thursdays from Jan. 12th to Feb. 2nd Prof. R. J. S. McDowall will deliver a course of lectures on the Integration of the Circulation. These lectures will take place at King's College, Strand, W.C. The Respiratory Functions of the Blood will be the subject of four lectures which Dr. L. E. Bayliss will give at University College, Gower-street, W.C., at 5 P.M., on Mondays and Fridays from Jan. 16th to 27th. Prof. John Mellanby will take the chair at the first of the two lectures which Sir Charles Sherrington will give at University College on Jan. 30th and Feb. 6th at 5.30 P.M. On Jan. 30th Sir Charles will speak on the Flexibility of Reflex Action, and on Feb. 6th on the Spinal State. There will be cinematographic illustrations of the second lecture. Prof. Max Bergmann, of Dresden, will give three lectures on the Chemistry of Proteins at University College Hospital medical school at 5.15 P.M. on Jan. 20th, 23rd, and 24th. No ticket is required for these lectures.

Society of Apothecaries of London

At recent examinations the following were successful:—

Surgery.—J. L. Bates, Guy's Hosp.; A. E. Glanvill, Univ. of Birmingham; J. Harris, Univ. of Witwatersrand and Middlesex Hosp.; C. A. Saggoo, King's Coll. Hosp.; and L. Wailer, Guy's Hosp.

Medicine.—W. E. P. Corbett and F. M. F. Forrest, St. Mary's Hosp.; M. F. Levick, Univ. of Sheffield; E. M. F. O'Donovan, Royal Free Hosp.; and J. C. Selnes, Univ. of Oslo and Charing Cross Hosp.

Forensic Medicine.—M. F. Levick, Univ. of Sheffield; C. W. O'Donoghue, London Hosp.; J. C. Selnes, Univ. of Oslo and Charing Cross Hosp.; M. Sourasky, Charing Cross Hosp.; and E. Teplitzky, Univ. of Berne and St. Mary's Hosp.

Midwifery.—L. Bhanot, Royal Free Hosp.; P. D. Bhatt, London Hosp.; E. L. Burgess, King's Coll. Hosp.; W. H. Ekin, Univ. of Cambridge and Westminster Hosp.; A. J. McGuire, Univ. of Manchester and Charing Cross Hosp.; J. C. Selnes, Univ. of Oslo and Charing Cross Hosp.; and T. B. Smith, St. Mary's Hosp.

The following candidates, having completed the final examination, are granted the diploma of the Society entitling them to practise medicine, surgery, and midwifery: J. L. Bates, P. D. Bhatt, F. M. F. Forrest, J. Harris, M. F. Levick, C. A. Saggoo, J. C. Selnes, and E. Teplitzky.

Lectures on Primitive Man

The Swiney lectures on geology will this year be devoted to Primitive Man, and are being given in the lecture theatre of the Imperial College of Science, Exhibition-road, South Kensington, London, S.W., at 5.30 P.M., on Mondays, Wednesdays, and Fridays, by Mr. T. M. Finlay, D.Sc. The series of 12 lectures began last Wednesday; admission is free; and the programme may be had from the director of the British Museum (Natural History), Cromwell-road, S.W.7.

Royal Sanitary Institute

A joint meeting of this institute with the food group of the Society of Chemical Industry will be held at the institute (90, Buckingham Palace-road, London, S.W.), at 5.30 P.M., on Friday, Jan. 20th, when Mr. E. B. Hughes, F.I.C., of Messrs. J. Lyons and Co., will open a discussion on Factory Cleanliness in the Food Industry. The speakers will include Dr. Thomas Carnwath, Lieut.-Colonel Gerald Leighton, M.D., Dr. Charles Porter, Sir Weldon Dalrymple-Champneys, M.D., and Dr. T. W. Naylor Barlow.

Congress on the Care of Children

A Congrès International pour la Protection de l'Enfance will be held in Paris from July 4th to 9th, 1933. The main subject of discussion will be the relation between Charity and the State. The eight sections of the congress will be devoted to maternity, early childhood, late childhood, adolescence, abnormal childhood, social service, legal rights of the child, and lastly to questions of maternal and child welfare not included under any of these headings. Particulars may be had from the secretariat at 26, Boulevard de Vaugirard, Paris, XV.

German Society for the Study of the Circulation

The sixth annual meeting of the Deutsche Gesellschaft für Kreislaufforschung is to be held at Würzburg from Sunday, March 5th, to Tuesday, the 7th, when Prof. E. Magnus-Alsleben will preside. The subject chosen for discussion is the relation of the circulation to the nervous system, the first day being given up to the theoretical side, chairman Prof. H. E. Hering (Cologne), the second to clinical observations, chairman Prof. F. Kauffmann (Berlin). Anyone wishing to give papers or demonstrations should give notice before Jan. 15th to Prof. Magnus-Alsleben, Medizinische Poliklinik, Würzburg. The meetings will be held in the University Ophthalmic Clinic, Röntgenring 12.

Post-graduate Courses in Berlin

International medical post-graduate courses are to be held in Berlin on the following subjects: internal medicine (Feb. 27th to March 4th); practical hæmatology (March 6th to 11th); diseases of the skin and venereal diseases (March 20th to April 1st); practical improvements in radiotherapy (April 2nd to 9th); and surgery (April 24th to 29th). Monthly courses on all special fields of medical science, including practical work, will also be held. Arrangements are being made to hold a further series in the autumn of 1933, dealing with the following subjects: endocrinology, thoracic surgery, malignant disease, narcosis, the theory of colloids, diseases of children, ophthalmology, heredity, and orthopædics. Particulars of all these courses may be had from the information bureau of the Kaiserin Friedrich-Haus, Robert Koch-Platz 7, Berlin, N.W.7.

Fellowship of Medicine and Post-Graduate Medical Association

A demonstration of selected cases of general medical and surgical interest will be given at the Lambeth Hospital on Friday, Jan. 13th, at 2 P.M. A series of lectures on Practical Problems in Medicine and Surgery will be given on Tuesdays at 4 P.M. at the Medical Society of London, 11, Chandos-street, Cavendish-square, W., beginning on Jan. 17th. A demonstration of X ray films will also be given there by Dr. Peter Kerley on Friday, Jan. 20th, from 4.30 to 6 P.M. Three-quarters of the time will be devoted to chest and heart, and one-quarter to the intestinal tract. A course in cardiology, occupying the whole of each day with demonstrations and lectures, will be given at the National Heart Hospital from Jan. 16th to 27th. It is hoped to arrange a demonstration of cases dealing with Diseases of Children on Thursday, Jan. 26th, at 8 P.M., at the National Temperance Hospital, Hampstead-road. The demonstration will be of a practical nature, and two physicians and one surgeon will be in attendance with suitable cases which the post-graduates will be enabled to examine. Other forthcoming courses include dermatology, gynæcology, diseases of chest, antenatal treatment, &c. Application for further particulars should be made to the Secretary of the Fellowship at 1, Wimpole-street, W.1. The above courses and demonstrations are open only to members and associates.

Hunterian Society

The Hunterian lecture of this society will be delivered at the Cutlers Hall, Warwick Lane, London, E.C., at 9 P.M. on Monday, Jan. 16th, by Dr. Einar Thomsen, of Copenhagen. His subject will be Experimental and Clinical Studies of Gastric Juice.

The annual dinner will be held at the May Fair Hotel, Berkeley-street, W., on Thursday, Feb. 9th.

Royal Institution

The programme of lectures to be delivered between now and Easter include Friday evening discourses on the Crystals of the Living Body, by Sir William Bragg (Jan. 20th), on the Physical Nature of the Nerve Impulse, by Prof. A. V. Hill (Feb. 10th), and on Mind and Man, by Prof. G. Elliot Smith (March 24th). Among the courses of lectures to be held in the afternoons is one on Recent Advances in Genetics, by Prof. J. B. S. Haldane, and one on the Evolution of the Mind, by Prof. Elliot Smith, beginning respectively on Jan. 19th and March 16th.

Institute of Medical Psychology

A lecture on Occupational Therapy, followed by a demonstration of the various methods by which it can be applied to physical and mental illness, will be given at the new premises of this institute, 6, Torrington-place, London, W.C., at 3 P.M. on Saturday, Feb. 4th. Twenty lectures (for members of the medical profession only) on Psychological Types and Mechanisms, forming an introductory course of psychological medicine for practitioners, will be given on Wednesdays, from Jan. 18th to March 22nd. The lecturers will be Dr. E. Graham Howe (3 P.M.) and Dr. H. Crichton-Miller (4.30 P.M.). Tickets for the lecture and for the course should be obtained in advance from the honorary lecture secretary of the institute.

National Smoke Abatement Society

This society has sent to 130 local authorities a memorandum suggesting the establishment of further regional advisory committees similar to those which have for some time operated in greater London, the Midlands, the West Riding of Yorkshire, and the Manchester districts. It is suggested that local authorities should coöperate to form five new areas for Tyneside, Tee-side, North East Lancashire, Merseyside and South West Lancashire, and the Potteries. The existing advisory committees, which were formed with the assistance of the Ministry of Health, are endeavouring to secure greater uniformity in the administration of the law relating to the emission of smoke. Even greater importance is, however, attached to the preventive than to the punitive side of the work. The committees already in operation include among their activities the standardisation of methods of taking observations, the encouragement of training courses for stokers, and the issuing of certificates for efficiency, the encouragement of better relations between local authorities and manufacturers, and the collection of data respecting the latest developments in smoke prevention apparatus and appliances.

Births, Marriages, and Deaths

BIRTHS

LAWRENCE.—On Christmas Day, 1932, at Ivanhoe, Old Stratford, Northants, the wife of Dr. E. D. Lawrence, of a daughter.

ROTHERY.—On Jan. 2nd, in a London nursing home, the wife of Dr. Basil Rothery, of a son.

MARRIAGES

NEALE—WRIGHT.—On Dec. 24th, very quietly, at St. Pancras Parish Church, Arthur James Reginald Neale, of Croydon, to Caroline Isobel Wright, M.D., of London.

SANDERSON—DE LA HEY.—On Dec. 21st, at Folkestone, Geoffrey Hugh Sanderson, M.A., M.B., of Horncastle, Lincs, to Noreen Elizabeth, daughter of W. H. P. de la Hey, Courteen Hall, Simla, India.

DEATHS

COVEY.—On Dec. 26th, Edward Alan Rustat Covey, L.R.C.P., L.R.C.S., L.S.A., of Linden-grove, Shirley-road, Southampton, aged 65.

HADWEN.—On Dec. 27th, at Brunswick House, Gloucester, Walter Robert Hadwen, J.P., M.D., M.R.C.S., L.R.C.P.

KEEN.—On Christmas Day, 1932, Dr. Agnes Keen, of London-road, Bromley.

ROSE.—On Dec. 25th, at "Grey Walls," Seaford, Capt. Frederick George Rose, M.A., Ph.D., R.A.M.C., late H.M. Consul, Stuttgart, aged 65 years.

SHEPHEARD.—On Dec. 31st, 1932, Philip C. Shepheard, J.P., M.R.C.S., L.S.A., of Abbots Hall, Aylsham, Norfolk, aged 94. R.I.P.

WILSON.—On Dec. 27th, at St. Thomas's Hospital, London, William Craig Wilson, B.A., M.B., Ch.B., of Cleveland-gardens, W., aged 27.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

OBITUARY

SIR ALEXANDER HENDRY, K.C.V.O., M.D. Edin.

FOR 22 years, ending last January, Sir Alexander Hendry was continuously associated with the Royal Household at Balmoral. He belonged to the neighbourhood, being born at Braemar in 1867, and was educated at Aberdeen grammar school before going on to the University of Edinburgh. Graduating in medicine in 1892, he was soon established in practice at Ballater, where he was to spend the rest of his life. He acted as certifying factory surgeon for the district, and was later medical officer for several parishes. In 1904 he began his medical attendance at Balmoral Castle, and six years later he was appointed surgeon apothecary to the Household there. He became a Member of the Victorian Order in 1911, and a Companion in 1924; promotion to knighthood followed in 1931. He was a justice of the peace for Aberdeenshire, and was elected provost of Ballater last year. He died on Dec. 29th at Aberdeen.

Sir Alexander Hendry married twice. His second wife, who survives him, is the daughter of the late Mr. George White, of Great Missenden.

WALTER ROBERT HADWEN, M.D. St. And.

Dr. Hadwen who died on Dec. 27th at his home at Gloucester, after being taken ill with heart trouble on Nov. 29th, had long been president of the British Union for the Abolition of Vivisection, and for many years laboured in the public advocacy of the repeal of the Vaccination Acts and the abolition of vivisection; but though opposed to scientific medicine he supported movements connected with temperance, food, hygiene, sanitation, education, and burial laws. He was a magistrate, and did much municipal work in Gloucester. Born at Woolwich in 1854, he was the eldest son of Mr. W. R. Hadwen, of Burnham, Somerset. He was educated at a private school and Bristol University College, and 15 years later took up medicine when he entered the Bristol medical school, and qualified M.R.C.S., L.S.A., in 1893. Although so late in the field, he became a prizeman and gold medallist in surgery at the Bristol Royal Infirmary, after having taken prizes in physiology, operative surgery, pathology, and forensic medicine. He obtained the M.D. St. Andrews in 1897. He travelled widely, and his published works cover a range of subjects outside the practice of medicine. His name was prominently before the public in 1924, when he was acquitted at Gloucester Assizes on a charge of manslaughter, based on his treatment of a 10-year-old girl, alleged to have been suffering from diphtheria. The trial gave opportunity for him to assert disbelief in the germ theory of disease.

THE LEBANON HOSPITAL.—This mental hospital, which is situated on the road from Beyrout to Damascus, has this year treated 373 patients. The hospital comprises nine houses, with workshops, hall, laundry, and other buildings. Sixty beds have been added during the last two years, through legacies and special donations, bringing the total number up to 252. Every house that is opened brings a new stream of applicants for admission, so that, as fast as buildings can be provided, they are filled. The hospital is now in urgent need of two further houses (40 beds each), one for men and one for women. New houses, once built, are now almost self-supporting by the fees of the richer patients and the capitation fees paid by the Lebanese Government for the very poor. It is impossible, however, to obtain money locally for capita expenditure.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Jan. 10th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY: MEDICINE. Special discussion on the Treatment of the Anæmias. Openers: Dr. L. J. Witts and Prof. Stanley Davidson.
WEDNESDAY.—5 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Clinico-pathological Meeting. Films: Sir Charles Gordon-Watson: Resection Anastomosis of Colon. Mr. J. P. Lockhart-Mummery: Operation for Fistula. Cases and specimens: Sir Charles Gordon-Watson: 1. Megacolon Resected. Mr. J. P. Lockhart-Mummery: 2. Epithelioma of Anus Treated with Radium. 3 and 4. Imperforate Anus. 5. Congenital Deformity of the Anus. 6. Lipoma of the Colon. Mr. W. B. Gabriel and Mr. Frederick Roques: 7. Carcinoma of Rectum Invading the Vagina and Uterus, and Treated by Perineal Excision and Vaginal Hysterectomy. Mr. Vaughan Hudson: 8. Villous Papilloma of Transverse Colon.
THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY. Paper: Prof. C. D. de Langen (Batavia): Studies on Blood Regeneration and Blood Diseases in Java. MEDICINE: PATHOLOGY. Members of the Sections of Medicine and Pathology are specially invited to attend.
FRIDAY.—8 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Mr. Tudor Thomas: Corneal Transplantation of an Opaque Cornea (with demonstration of the case).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Jan. 9th.—8 P.M., Pathological Evening.

HARVEIAN SOCIETY OF LONDON.
THURSDAY, Jan. 12th.—8.30 P.M. (at 11, Chandos-street, W.), Annual General Meeting. Mr. C. P. G. Wakeley: The Rôle of Specialisation (Presidential address).

SOUTH-WEST LONDON MEDICAL SOCIETY, Bolingbroke Hospital, Bolingbroke-grove, Wandsworth Common.
WEDNESDAY, Jan. 11th.—9 P.M., Mr. F. N. Doubleday: Dental Infection as a Source of General Disease.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Jan. 13th.—7.15 for 7.30 P.M. (at Hotel Rembrandt, Brompton-road), Dinner Meeting, to be followed by a discussion, at 8.30 P.M., on Arthritis. Opener: Mr. Timbrell Fisher.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Jan. 10th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Dr. T. Drummond Shiels: The Objects and Methods of the British Social Hygiene Council. Visitors are invited.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury-square, W.C.
TUESDAY, Jan. 10th.—8.30 P.M., Dr. G. Roche Lynch: Poisons and their Effects.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 9th, to SATURDAY, Jan. 14th.—LAMBETH HOSPITAL, Brook-street, S.E. Frid., Demonstration of selected cases of general medical and surgical interest at 2 P.M.—Open only to Members and Associates of the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.
MONDAY, Jan. 9th.—10 A.M., Medical Wards, Skin Dept., Genito-urinary Operations. 2 P.M., Medical, Surgical, Eye, and Gynæcological Out-patients, Surgical Wards. Operations.
TUESDAY.—10 A.M., Medical Wards, Surgical Demonstration. 2 P.M., Medical, Surgical, Throat, Nose, and Ear Out-patients, Operations. 4.15 P.M., Lecture, Mr. Tyrrell Gray: The Rôle of the Mesentery.
WEDNESDAY.—10 A.M., Medical Wards, Children's Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients.
THURSDAY.—10 A.M., Neurological Department, Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patients. 4.15 P.M., Lecture, Dr. Scott Pinchin: Pulmonary Suppuration.
FRIDAY.—10 A.M., Skin Department. 12 noon, Lecture: Therapeutics. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.
SATURDAY.—10 A.M., Throat Operations, Medical and Surgical Wards. Surgical and Children's Out-patients. The lectures at 4.15 P.M. are open to all Medical Practitioners without fee.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Jan. 10th.—5 P.M., Sir E. Graham-Little: Cicatricial Alopecia.
THURSDAY.—5 P.M., Dr. W. J. O'Donovan: Stocking Erythroderma.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Jan. 13th.—4 P.M., Mr. C. Gill-Carey: Rhinological Aspects of Asthma.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Jan. 12th.—9 P.M., Mr. H. Edwards: The Treatment of Minor Injuries.

GREAT NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Jan. 10th.—3.15 P.M., Dr. C. C. Beatty: Demonstration of Cases.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Jan. 12th.—4 P.M., Mr. L. E. C. Norbury: Colostomy.

GLASGOW POST-GRADUATE LECTURES.
WEDNESDAY, Jan. 11th.—4.15 P.M. (at the Western Infirmary), Prof. T. K. Monro: Medical Cases.

Appointments

City of London Maternity Hospital, City-road, E.C. CHRISTIE-BROWN, R., M.S. Durh., F.R.C.S., Obstetric Surgeon; DODDS, R. L., M.B. Belf., F.R.C.S. Eng., O'SULLIVAN, J. V., M.D. N.U.I., F.R.C.S. Eng., and BLAIKLEY, J. B., M.B. Lond., F.R.C.S. Eng., Asst. Obstetric Surgeons; CONNELL, J. G., M.R.C.S., Asst. Resident M.O.

Vacancies

For further information refer to the advertisement columns

Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bolton Royal Infirmary.—H.P. £200.
Bury Infirmary, Lancs.—Sen. H.S. At rate of £200.
Central London Ophthalmic Hospital, Judd-street, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Second and Third Assts.
Dublin, Saint Michael's Hospital, Dun Laoghaire.—Ophth. S.
Enfield Urban District Council.—Two Asst. M.O.'s of Health. Each £300.
Evelina Hospital for Sick Children, Southwark, S.E.—Hon. Physician to Skin Dept. Also H.P. At rate of £120.
King Edward Memorial Hospital, Ealing.—Jun. Res. M.O. £150.
Leeds Hospital for Women.—H.S. At rate of £100.
Leicester Royal Infirmary.—Hon. Surg.
London Homœopathic Hospital, Great Ormond-street, W.C.—Res. M.O. £100.
London Jewish Hospital, Stepney Green, E.—Second Radiologist.
Manchester, St. Mary's Hospitals.—Asst. M.O. for Children's Out-patient Dept. At rate of £150. Res. Obstet. O. for Whitworth-street West Hospital. £175. Also Three H.S.'s to Special Depts. Each at rate of £50.
Margate and District General Hospital.—Res. M.O. £150.
Market Drayton, Cheshire Joint Sanatorium.—H.P. £250.
Middlesex County Council.—Ophth. S. £2 12s. 6d. per session.
Middlesex Hospital and Medical School, W.—Medical Registrarship. £300.
Newcastle General Hospital.—Two H.S.'s and One H.P. Each at rate of £150.
Northwood, Mount Vernon Hospital.—Gynæcologist.
Nottingham City Mental Hospital.—Jun. Asst. M.O. £350.
Rotherham Hospital.—H.P. £180.
Royal Chest Hospital, City-road, E.C.—Physician for Out-patients' Dept.
Royal London Ophthalmic Hospital, City-road, E.C.—Gifford Edmonds Prize in Ophthalmology. £100.
Royal Northern Hospital, Holloway, N.—H.P. At rate of £70.
St. Albans, Herts, Cell Barnes Colony for Mental Defectives.—Deputy Med. Supt. £600.
St. Giles' Hospital, Brunswick-square, Camberwell, S.E.—Res. Med. Supt. £1300.
St. John's Hospital, Lewisham, S.E.—Hon. Skin Physician. Also Res. H.P. and Cas. O. Each at rate of £100.
St. Stephen's Hospital, Fulham-road, S.W.—Clin. Asst. At rate of £100.
Society for Prevention of Premature Burial.—Medical Examiners.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £150.
South London Hospital for Women, Clapham Common, S.W.—Surg. Reg. 50 gns. Out-patient M.O. and H.S. Each at rate of £100.
Tilbury Hospital, Essex.—H.S. £140.
University College Hospital, Gower-street, W.C.—Hon. Asst. Surg. to Ear, Nose and Throat Dept.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. Surg. Reg., H.P., and H.S. Each at rate of £100. Also Out-patient Anæsthetist. 10s. 6d. per attendance.
West End Hospital for Nervous Diseases, Gloucester-gate, N.W.—Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith, W.—Cas. O. At rate of £250. Also Asst. Gynæcologist.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Anæsthetist. One guinea a visit.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Newport, Isle of Wight.

NOTES, COMMENTS, AND ABSTRACTS

THE MEDICAL SCHOOLS AND THE NATION'S HEALTH*

BY JAMES YOUNG, D.S.O., M.D., F.R.C.S. EDIN., F.C.O.G.

GYNÆCOLOGIST TO THE ROYAL INFIRMARY, AND PHYSICIAN TO THE ROYAL MATERNITY HOSPITAL EDINBURGH

[Dr. Young began by pointing out that the due relation of medical schools and the medical profession to recent developments in public health can be understood only if we keep prominently before our minds the sources from which these have sprung, and the factors responsible for the rapidity of their growth within the past few generations. He then described the great hygienic movements of the nineteenth century, as the community awoke to the squalor and filth which accompanied the rising industrial age. A reduction of the death-rate and a prolongation of average individual life became associated with the efficient disposal of sewage and the provision of a pure food- and water-supply. But he found these things to owe little to the medical schools, though medicine played its part in the advance, particularly by discovering the bacterial nature of infectious disease. Modern sanitation, as the dominating achievement of the nineteenth century, he considered due in the main to the vision and energy of public men and corporations, and not to organised medicine. He asked his hearers to reflect upon the fate of communities to-day if the defences of hygiene were withdrawn, when all pestilences would be rapidly disseminated by modern methods of intercommunication; but inevitable though it was that the medical profession and the public should be pervaded with the spirit of prevention, he found the organisation and traditions of the medical schools not to promote that spirit. He continued:—]

The Emphasis upon the Curative Aspects

It is a matter of commonplace that the emphasis in medical teaching is placed upon the curative aspects, that is, the training is so organised as to prepare the doctor for the recognition and treatment of frank disease. His preliminary years are spent in the study of the *medical sciences* to provide him with that framework and that scientific attitude necessary for his later approach to the clinical subjects embraced within the *medical art*. The function of the medical art, as we understand it, is the alleviation or the cure of disease, and so dominating has this therapeutic aspect become by the necessities of tradition and evolution that it is difficult to see how such a conception as the elimination of disease by the protection of health can find for itself a place in such unfamiliar surroundings. And we must make no mistake in regard to the magnitude of its claims; it demands priority of position and broad space for its growth and expansion.

Where, in our schools organised for the study of disease, can we find a place for the gospel of health? Where, in a scheme leading from chemistry and anatomy and physiology through pathology and the post-mortem room to clinical medicine and clinical surgery, can we break the chain to accommodate the new evangel? It would be hard to expect the professors of medicine and surgery to adjust themselves to the rôle of hygienists, for are they not the completed product of the schools of disease, and have they not reached their academic distinction and power just because they are proved exponents of its teaching, or have discovered, perchance, newer methods for the diagnosis and treatment of disease? And, if we thrust upon their shoulders, already heavily burdened with the load of disease, the added task of hygiene, as some with more enthusiasm than a sense of fitness have urged, where will we have them begin, and how will they proceed?

Modern Specialism and the Narrow Outlook

In this connexion we have only to reflect a moment to recognise how increasingly pledged medical thought and tendency have become within recent years to a preoccupation with disease. For have we not, during the past few generations, unleashed a whole new host of ardent seekers in the field of the morbid? The growth of specialism, both in its rapidity and its extent, has become one of the most remarkable features of modern medicine. We may with justice describe the present era as that in which almost every organ and function in the body has evolved its own specialism and its own particular votary.

The general results of such a remarkable development must naturally be profound. To it we must in part look for an explanation of our present hospital impasse, because each such specialism has surrounded itself with an elaborate and expensive system of equipment, personnel, and remedial measures, and has flourished only because it has found a home within the walls of the wealthy organisation of our charity hospital, to which the greater part of the community has had perforce to turn in its time of need.

A further result of great significance is that the claims of the specialty in regard to the rapidity of its expansion, its technique, its literature, &c., are so insistent that it may, and often does, imply that the specialist must from his earliest days forsake the broad territory of medicine and devote himself entirely to the restricted field of his chosen craft. Once the die is cast it is inevitable that the more his life is occupied with his specialism the more does he lose touch with the general aspects of the medical art. A general practitioner friend of mine of wide experience and sound discrimination has aptly expressed the position by the remark that "the specialist is usually a bad doctor," and it is not difficult to see that in such an impeachment there must be a sound basis of truth. The circumstances of the specialist's life are prone towards a still further narrowing of outlook in that from the nature of his calling he is so frequently summoned to the patient only when the ailment is advanced and even terminal. This is probably specially true of the surgical specialties though it applies in considerable measure to those more purely medical. It thus happens that the preoccupation of specialism is apt to be largely with a cruder diagnosis and even more with a cruder treatment and to find small opportunity for the cultivation of that philosophic spirit that derives its chief exercise and its greatest satisfaction in the study of ultimate causes and in prevention.

It is in the nature of specialisation that it cannot easily escape from the limitations that it creates for itself. The danger is that in our admiration for the precision of its knowledge or the manipulative skill of its exponents we should forget the relative and topical character of its contribution. For the study of a separate organ receives its complete sanction

* Abridged from the presidential address to the Edinburgh Obstetrical Society, delivered on Nov. 9th, 1932.

only when it is related to the whole, and by the whole we mean the organism in respect, not only of its anatomy and its physiology, but also of its environment and its habits, its sociology, and those other agencies which by their interplay react on the health and well-being of the individual.

The outstanding triumphs of modern surgery have surrounded it with a glamour that has tended to exalt it above its proper sphere in the medical organon and to give to its votaries a place and power which is hardly commensurate with the degree in which their craft has contributed to an enrichment of the science and art of medicine in the wider and fuller sense. More significant, however, than such questions of pride of place, the movement thus symbolised has tended to a corresponding depreciation of the value of general medicine and of the paramount importance of the general outlook. It has succeeded in establishing the specialisms in a place of primary authority when their function should be contributory and ancillary. At the best the function of specialism is that of the expert witness, at its worst it may degenerate unless controlled into a cruel and merciless exploitation of the public. It may inspire the carrying out of surgical operations that, based upon a limited diagnosis, are condemned to failure and it may lead to the extirpation of diseased organs by surgeons who pursue their routine work unmindful of the factors which in the community may be breeding *in perpetuo* material for their scalpel.

The supreme task of the next generation, alike in the interest of health ideals as of curative medicine, is a readjustment of our outlook in these matters. It is the opinion of many who have been disquieted by present medical tendency that the salvation of our art in its great duality of function is to be found in one way only—namely, by the creation of a body of well-trained practitioners to whom will be handed back the authority often usurped by those who are ill-equipped to exert it with judgment and skill. There can be no question that only in so far as we recover for the mind at the centre the supreme decisions in regard to health and disease will we lead to a reintegration of much that is disruptive in modern medicine and only in this way will we recapture for the profession its soul and, for the public, its safety.

[Dr. Young here dwelt on the great effort of James Mackenzie to assess the extent to which disease is really capable of diagnosis, and continued :—]

Failure of Medical Schools

There is no more eloquent sign of the inability of the medical schools as at present organised to exercise creative leadership in these matters or even to accommodate the ideals of preventive hygiene than the nature of the reception which some of the new health movements have received at their hands. Take, for example, those national aspirations for the protection of child life and child welfare, aspirations that owe their genesis in the main to a social conscience stirred by the amount of ill-health revealed in school-children when, consequent upon the enactment of compulsion in education, they first came under the organised supervision of the community. This movement had grown to be national and it had become an important charge on municipal health activities before it had created a ripple on the surface of organised medical opinion. It was only as recently as 1923 that out of deference to this strong social conviction the General Medical Council added the subject of infant hygiene to its recommendations for the revised medical curriculum. Despite the pressure reaching them from such different and such influential sources and the great opportunity presented to them of identifying themselves with the most important of all health movements, that directed towards the young child, the medical schools even now make for the most part only a very inadequate provision for the teaching of their students in matters of infant health. It has been left to the public authorities through their child welfare clinics and such independent bodies as the Mothercraft Training Society to explore the great new field presented by the healthy child and to garner for themselves the knowledge required for the expansion of such communal efforts. It is unfortunate that in regard to this beneficent social awakening to the value of child life and health the organised medical profession has lost a great chance of leadership.

As a further instance of restricted vision and the difficulty of our medical schools to align themselves with health-saving activities, let us take that world-wide movement for the protection of motherhood. It has long been evident that one essential step towards an alleviation of the dangers of childbirth is an improvement in the teaching of our medical students in midwifery. In the past this has been carried out by the schools in a manner sometimes described as scandalous. Despite the gravity of the issues involved, despite the widespread social disquietude provoked by the spectacle of so many young and healthy women annually lost or hurt in the performance of a physiological act, relatively few schools have yet found it possible to make provision for the bare teaching requirements.

The chief reason advanced for the delay in providing adequate teaching in midwifery and child health is the already crowded character of the medical curriculum and the lack of time available even for such an urgent need. There is, of course, considerable truth in an objection based upon the multiplication of the specialisms that have demanded inclusion in the teaching programme. At the same time there is reason for the view that, apart from such considerations, the curriculum has acquired a rigidity that has deprived it of the capacity of responding to the needs of each new age. It is, for example, often pointed out that botany, which owed its original inclusion to the fact that so many of the drugs used in medicine were derived from the vegetable kingdom, can no longer justify its retention on such grounds. It is the opinion of many, also, that anatomy has a quite inordinate amount of time allotted to it and that the full purpose of the admittedly important part this science must always retain would be served were a shorter period appropriated for its study. There can be little doubt that the overwhelming place sometimes claimed for anatomy has its origin in the position this subject has occupied in the historical development of the medical art. It was, in a sense, the first and, for long, the only medical science. We are apt to forget that the time has long passed when its association with anatomy gave to medicine its only claim to science, when, indeed, the medical art was compounded of anatomy and obscurantism.

It is thus arguable that the difficulties facing the medical schools in the way of making room for new subjects as these arise in the evolution of our craft spring, at least in part, from that same lack of resilience to the impact of new ideas to which we have been directing attention in the preceding pages. As a further example of this same irresponsiveness to big preventive ideals, let us take the attitude of the schools to the subject of nutrition, that most pervasive of all the factors of health. Where, in our

schools, do we find this expounded with the completeness and thoroughness which it demands? Can we conceive of any subject which is more suited for earnest study by our great schools or one which offers to them such an opportunity for creative leadership and instruction? The extent of the influence wielded by nutrition in the mental and physical welfare of the community it is impossible to overrate. In a manner the very essence of health is sound nutrition and of disease faulty nutrition. From the antenatal period onwards through infancy and childhood this influence is supreme and the ultimate individual in his reactions and his resistance to his environment, including the extrinsic factors of disease, is, in a real sense, a product of his nutrition.

Who can say how many of the diseases of our present civilisation spring from the food we eat? Enough has already been learnt to suggest that the dental caries so typical of our race springs predominantly from the vitiation of the processes of teeth formation in the unborn fœtus or in infancy as a sequel of dietetic deficiency. Rickets is a disease of deficiency. Tuberculosis is in great part a disease spread by our infected milk-supplies. Dyspepsia, infection of the tonsils, rheumatism, heart and kidney disease, and a host of other morbid states that can be mentioned, who is to say how many of these are essentially the products of faulty nutrition? And of the "undiagnosable" diseases of Mackenzie, comprising some 60 per cent. of all diseases according to this eminent medical philosopher, in how many is the key to their secrets to be found, not in the abstruse biochemical or immunological investigations that engage the energies and the intellects of our laboratories, but in the far-reaching influences of racial nutrition?

It is true that during the past generation much research of outstanding value on nutrition has emerged from medical laboratories. The work of Hopkins, Mellanby, and others has opened up a new epoch in the study of the subject. Nevertheless, the scientific progress which such investigations connote has been the product of isolated laboratories and the work of isolated individuals rather than the outcome of an organised effort springing from an appreciation by the schools of the great significance of the question. Doctors set out on their public career largely ignorant of its far-reaching importance, and how could it be otherwise when to their teachers, committed by the nature of their calling to an overwhelming concern with disease, the chief interest of nutrition arises from the manner in which it contributes to the production of such conditions as obesity, diabetes, and so on? The part played by nutrition in the determination of the health and growth of the individual from the intra-uterine period onwards throughout life, its influence on the industrial and social welfare of the race, the extent of the known and the fascinating fields of the unknown still waiting to be explored, to these and kindred subjects the student's mind had never been directed because there had been no teacher to whom this great opportunity had been presented and on whom this great responsibility had fallen.

(To be concluded)

INSTRUCTION ON SEX QUESTIONS

THE bulky but original writings upon the sexual question of Havelock Ellis, Hirschfeld, Westermarck, the various schools of psycho-analysis, K. B. Davis, R. L. Dickinson, and others, continue to be popularised in small volumes by writers of varying degrees of competence and erudition. Some of the books which reach us are written for children; others for adolescents, for brides and bridegrooms, for religious persons, and for the nondescript general public.

As is pointed out in a preface by Mr. Norman Haire, editor of the Library of Psychology and Sexology Series, Dr. Evans is an American who, writing for an American public, mixes science, religion, and sentiment in his book.[1] This is a somewhat rhetorical exposition of the part which should be played by the husband in his sexual approaches to his wife. The author's chief aim would appear to be to interpret to a well-meaning but stupid man the timidities and inhibitions which characterise the average woman's attitude to sex, and which, unless taken into account by her husband, will spoil her married life. The author hopes these fears will be dissipated if the young wife will sit down by her husband and read the pages of his book which begins with a description of the nervousness of the young bride on the first night of her marriage, and ends with an account of the positions in which coitus may take place.

In explaining how a book entitled "How I Was Born"[2] (which is intended for adults and not, as the title might suggest, for children) came to be written, Dr. Bryan makes an astonishing statement. He says that at the annual conference of the British Medical Association held at Eastbourne in 1931, a demand was made not only by doctors, but by eminent churchmen and by other well-known people, that the mysteries of sex should be cleared up in a plain and wholesome exposition by a medical man. After a year had passed, writes Dr. Bryan, no volume of reasoned explanation of these so-called mysteries had been placed before the public, and his book was written to fill the gap. The unawareness which the author reveals of the torrent of such "wholesome expositions" which has been let loose upon the public since the war, is matched by the apparent ignorance displayed in several of the 22 chapters of the book of the literature of the subjects therein expounded. Moreover, the reader is informed in a preface that the book is "not written with profound gravity but with a light touch which, while it may bring a frown to the few, will make it more readable to the many." While saying little about the psychological aspects of sex or marriage, it contains chapters full of anecdotes on castration, hybrids, hermaphrodites, and virginity. It is difficult to see to what class of reader this book will prove useful, unless to those in search of after-dinner stories.

A third book,[3] by Dr. Douglas White, aims at introducing the reader to "a fresh outlook on sexual questions which has mostly developed since the beginning of the century." It is, in fact, a praiseworthy attempt by a medical man with religious leanings to enunciate a philosophy of the sexual life in terms of modernist Christianity; or, in the author's words, to suggest "such an outlook on sex morality as may make an appeal both to the rational, ethical, and spiritual nature of those who desire to think and act in accordance with the highest ideals of human life." This book will probably meet the requirements visualised by the ecclesiastics who addressed the British Medical Association at Eastbourne, better than would the preceding one.

Dr. Wright states that her book[4] has the object of building up in young people "an attitude of mind towards sex which will view the whole question against the background of evolution in plant and animal life." This purpose is well fulfilled. The volume is abundantly illustrated, and is simply divided into four chapters entitled: sex in plants;

[1] Man and Woman in Marriage. By C. B. S. Evans, M.D. International Library of Psychology and Sexology. London: John Lane, the Bodley Head Ltd. 1932. Pp. 79. 5s.
[2] How I Was Born. By Cyril Phillips Bryan, M.B., B.Ch., B.A.L. London: John Bale, Sons and Danielsson, Ltd. 1932. Pp. 105. 5s.
[3] Modern Light on Sex and Marriage. By Douglas White, M.D. Modernist Series. London: Skeffington and Sons, Ltd. 1932. Pp. 128. 3s. 6d.
[4] What is Sex? An Outline for Young People. By Helena Wright, M.B., B.S. London: Noel Douglas. 1932. Pp. 172. 5s.

sex in animals; sex organs and their growth in human beings; and psychological development of sex instinct and its control. The last chapter raises some delicate questions about which there is as yet no formulated medical opinion, among them that of masturbation. The author's distinction between "harmless masturbation" which disappears of itself, and harmful masturbation which may produce physical disease of the sex organs, will not be accepted by those medical psychologists who hold that the injuriousness of the practice depends on psychological rather than on physical factors. Nevertheless, Dr. Wright's book could safely be given by parents to their sons or daughters when these reach adolescence.

APPLYING KNOWLEDGE TO INCREASE HAPPINESS

THE VALUE OF "AWARENESS"

SOME remarks made by the Regius professor of physic at Cambridge at a reception held last month at Institute of Medical Psychology, and briefly abstracted in our columns at the time,[1] contain a timely message for the New Year. "It has been said that the French rationalism of the eighteenth century cleared the ground for the upbuilding of natural science in the nineteenth. We can therefore understand," said Prof. Langdon Brown, "why nineteenth century science was inevitably materialistic. But that century also saw the romantic revival. There were consequently two diametrically opposed tendencies which had to be reconciled somehow. It was achieved by a hard core of materialism covered over by a veneer of romanticism. Changing the metaphor, the nineteenth century made for its goal with the aid of blinkers. But however much blinkers assist in concentrating attention on the goal, they prevent the wearer from seeing what is overtaking him. This may be a help to a horse, but it is a disadvantage to a man. The nineteenth century had no conception of what was overtaking it.

"The note of the twentieth century on the other hand is 'awareness.' It is much more aware of and sensitive to its environment. At present, however, it is only half aware. The blinkers are down, but no real adjustment has as yet been made. Hence there is great unhappiness. The old values have been swept away, without satisfactory new ones to take their place. If I didn't feel that a more complete awareness would help to remedy this, I should despair that we should be able to achieve anything at this institute. But I do most emphatically believe that we can do much by helping sufferers to understand more of the way in which their minds and emotions work. I was recently reading Sir Arthur Keith's description of his amazement when he found that his account of evolution was met by the mental attitude of Dayton, Tennessee. We have to remember that in matters of psychotherapy most of the patients that come here have the mental attitude of Tennessee, and we have to start from that point. I do not practise formal psychotherapy," Prof. Langdon Brown went on, "but I have been driven by sheer force of experience to realise the need for a more psychological approach to medicine. I was brought up in a most materialistic age of medicine, and only slowly came to realise the inadequacy of such an attitude. I found that quite as many people were ill because they were unhappy, as were unhappy because they were ill. So anxious were the former group to avoid that favourite diagnosis of 'just nerves' that they produced physical symptoms to account for their distress; yet the symptoms were not consistent with any organic disease, though they were often consistent with a disturbance of the sympathetic—i.e., the emotional, nervous system.

"To the patient who said 'I should be so ashamed if it is just nerves,' my usual reply was something along these lines. When I first went into the dissecting room, still under the impression that 'just nerves' meant just an imaginary illness, I saw a dissection of the brachial plexus. I thought that if a man's heart or lungs could go wrong, there was no reason why a complicated network like this plexus should not go wrong also. Then I go on to explain that this is not an exact illustration—for it is not a disturbance of these large nerve trunks which produces the symptoms he complains of, but the tiny branches between one nerve-cell and its neighbour. These particularly belong to the association cells, and the point which distinguishes the human brain from that of the lower animals is its wealth of such association cells. Why then, I ask, should you be so ashamed of something going wrong in what is so essentially a human characteristic?

In this way I can often pave the way for their being more receptive of psychotherapy. The illnesses dealt with at this institute are not imaginary, though they are connected with the image-making part of the brain. They often depend on the reactions between themselves and their nearest who ought to be, but are often not, their dearest. These emotional reactions are often painful, because they are only half-aware ones, and the unfavourable environment prevents satisfactory adjustments from being made. I often used to think, looking at the packed rows of patients in the out-patient room, that a lot of the good they undoubtedly receive from going to hospital was the opportunity it gave them of unburdening themselves to their neighbours, though they attributed it more to the bottle of medicine they were given.

"This institute," Prof. Langdon Brown concluded, "aims at scientific use of this unburdening and at skilled explanation of the symptoms resulting from these disagreeable and painful reactions arising from uncomprehended sources. It provides not only for proper treatment of nervous symptoms, but ensures that organic disease as a possible cause for such symptoms should not be overlooked. The work done here is unique, and marks a change in the whole point of view of medicine. It could thus assist in alleviating much misery and unhappiness so prevalent to-day."

[1] THE LANCET, 1932, ii., 1360.

DRIED MILK WITH ADDED IRON

THE firm of Ambrosia Ltd., Brighton Chambers, Denman-street, London, S.E.1, produces Ambrosia, a full cream Devonshire dried milk, the process of preparation not, it is stated, impairing the vitamins in fresh liquid milk. The firm have now placed on the market a combination of Ambrosia with iron ammonium citrate, designed for the treatment of anæmia in infants, nursing mothers, and other subjects where this form of nutrition is indicated. The preparation, to which, if necessary, extra vitamin D can be added, meets the recommendations in regard to the nutrition of infants contained in the recent circular letter from the Ministry of Health through its advisory commission on the subject.[1] The iron ammonium citrate added to the reconstituted Ambrosia products is to be prescribed for adults in the dose of grs. 10 per half pint, the suggested dose for infants being gr. 0·29 per ounce. The added vitamin D can be supplied in the preparation at an equivalent in antirachitic value to a teaspoonful of high grade cod-liver oil to one pint of milk. We are informed by the proprietors that they have received from various infant welfare centres evidence of the satisfactory employment of the preparation.

ENTERTAINMENT FOR THE BLIND.—From time to time we have referred to the excellent work which Dr. F. W. Alexander is doing for the blind. He has endeavoured to simplify the task of learning Braille; he has proposed a useful method of duplicating Braille broadsheets; and he has enlisted the aid of handicraft workers in making various kinds of puzzles (THE LANCET, 1931, i., 1006; 1932, ii., 224). He is now turning out quantities of literary puzzles in Braille—anagrams and the like—which will bring welcome employment to the leisure hours of blind people who can appreciate this type of entertainment. Those in touch with suitable recipients for such puzzles should apply to Dr. Alexander at Bankside, Ferry-road, Teddington, Middlesex.

[1] THE LANCET, 1932, ii., 1028.